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ROADS AND STREETS

FEBRUARY, 1945

Save with

TIMKEN ROCK BITS

Hundreds of contractors using Timken Bits have proved their superiority on thousands of construction projects with great satisfaction and profit. A trial on your toughest job will convince you that here is a tool you cannot afford to be without.

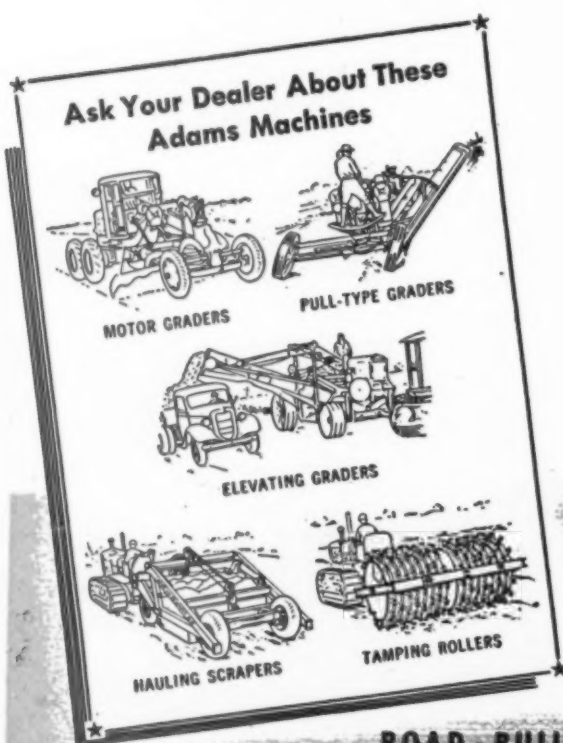
Drilling problems may differ widely, but among the performance characteristics of Timken Bits there is one or more that will result in worthwhile savings for you.

No matter what kind of rock you have to drill — from the softest to the hardest — Timken Bits will drill it to much greater advantage. Write for further information. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE MARK REG. U. S. PAT. OFF.

ROCK BITS



****A** WIDE, flexible range of operating speeds—ability to provide the *right* working speed for *every* construction and maintenance job—that's one of the important time-saving, money-saving features of Adams Motor Graders. Adams 8 forward speeds permit operator to select speed best suited for every type of operation at fastest practical rate—with transport speeds up to 21 m.p.h. for fast moving from job to job.

Many outstanding advantages combine to make Adams Motor Graders your best buy—rugged strength, rigidity, balanced weight distribution, ease and economy of operation, quick adaptability to all kinds of cuts. Discuss these advantages with your local Adams dealer.



J. D. ADAMS MANUFACTURING CO.
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Sales and Service Throughout the World

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ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

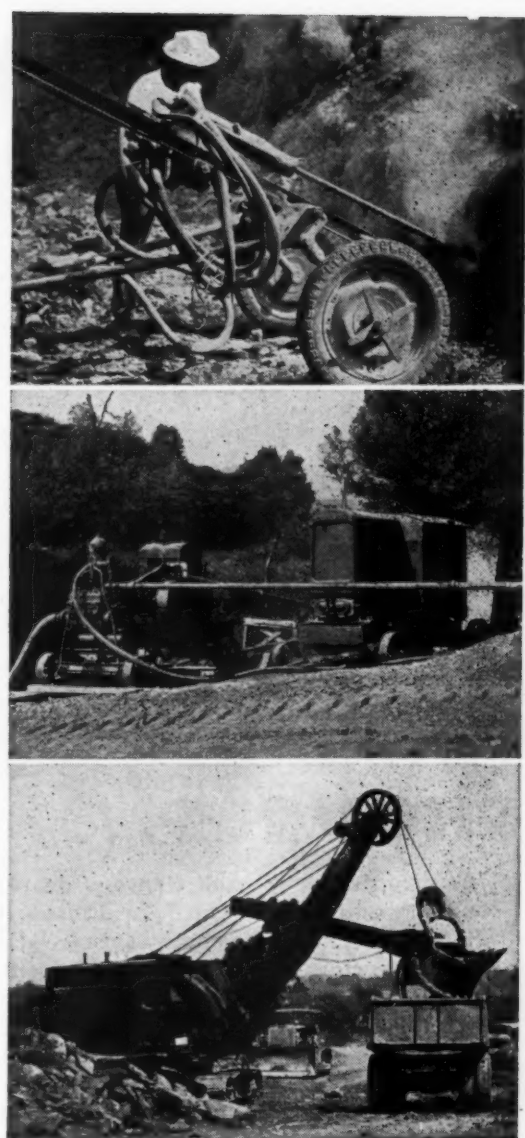
FROM START TO FINISH BUILD THE ROAD WITH BETHLEHEM STEELS

The Bethlehem hollow drill steel bites into hard rock, preparatory to blasting. From then on, there's a Bethlehem product to give rugged service, and to keep things moving along at top efficiency, in every important step in highway building.

Bethlehem Purple Strand Wire Rope lends a hand in the task of moving mountains of rock and earth, and in digging for sub-drains. Bethlehem corrugated sheets make culverts—or Bethlehem reinforcing bars go into concrete culverts. Bethlehem pipe carries water—many miles, perhaps—to the job.

Into the road go Bethlehem road joints, supplied assembled for placing. As the finishing machine moves along, Bethlehem bar mats are set in place. Then Bethlehem products mount guard along the completed highway—Safety-Beam or Cable guard rails, highway guard posts, right-of-way fence and posts.

Plan your postwar highways the Bethlehem way—by ordering all your road steel products from this one reliable source. It will save you time and, perhaps, many a headache. For full information about Bethlehem road steel service, get in touch with the nearest district office, or write direct to Bethlehem Steel Company, Bethlehem, Pa.



HANSON ROADS AND STREETS



TRUCK SHOVELS...

The records set up with Hansons on tough road building and construction jobs add up to one of the big reasons why so many successful engineers and contractors want Hanson equipment for their post war work. The speed, low operating costs and long life of Hanson Truck-Mounted Shovels and Cranes give you that "edge" which means so much in licking tough competition.

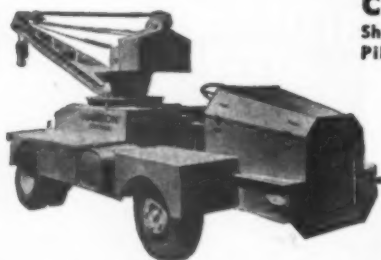
With Hansons you know you're "all set" for the big jobs ahead. Send for full details today.

CAPACITIES

3/8 and 1/2 Cu. Yd. Shovels
4 and 6 Tons Capacity Cranes

Convertible to:

Shovel—Crane—Dragline—
Pile Driver—Clamshell—
Trench Hoe



YARD AND DOCK CRANES

Mobile, versatile; one man operation; 2 to 30 miles per hour; 2 to 4 ton lift and carry; full 360 degree swing. A thousand uses in fast, economical material handling. Write for descriptive literature.

**THE HANSON
CLUTCH & MACHINERY CO.
TIFFIN, OHIO**

Vol. 88, No. 2

February, 1945



A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD
ROADS MAGAZINE AND ENGINEERING & CONTRACTING

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; HAROLD J. McKEEVER, Editor; CHARLES T. MURRAY, Managing Editor; JOHN C. BLACK, Field Editor; LT. COL. V. J. BROWN, Publishing Director (Absent on Military Duty); H. J. CONWAY, Advertising Editor; L. R. VICKERS, Promotional Director.

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TWO GREAT NEW RUBBER-TIRED DEVELOPMENTS!



The Moto-Crane "6 x 6"—for Unlimited Mobility

Developed for war use and proved under toughest military conditions, this new, huskier Moto-Crane features 6-wheel drive, exceptional soft-ground flotation and 20-ton capacity. Its eight speeds forward and two in reverse provide the range to move from job to job at 30 M.P.H. or crawl through the heaviest going. The "MC 6x6" is ideal for pipeline and other off-the-road construction where power and traction for tough going must be combined with versatile crane and shovel operation. Send for complete data.

First to produce a truck crane 27 years ago, Thew continues its long leadership in building rubber-tired cranes and shovels with these two latest developments — the new Moto-Crane "6x6" and the Self-Propelled Crane. To you and every user, these new machines bring new mobility, broader job applications, new speed and new low job costs. Get the facts now from your nearest Lorain distributor. Plan now on cutting postwar costs, getting the job done faster with these rubber-tired Lorains!



The Self-Propelled Crane for On-the-Job Mobility

One operator, one engine both propel and operate this new machine from a single control station. Featuring 20-ton capacity; 4 speeds to 7 M.P.H.; air-power steering; full revolving turntable; and simultaneous hoist, swing and travel, the Self-Propelled Crane is the perfect answer to high-speed material handling in yards, docks and on semi-stationary construction operations where on-the-spot, rubber-tired mobility is a factor. Send for complete data.

Reg. Trade Mark

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LORAIN, OHIO

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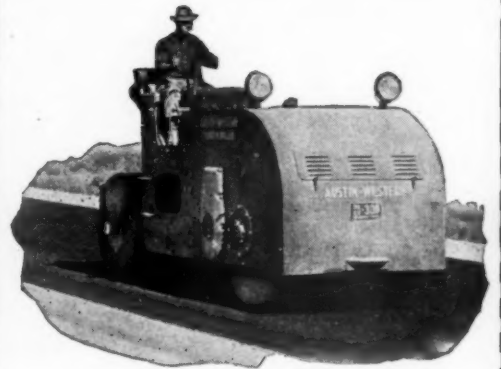
Exclusive features that save time and money by getting the job done better and quicker. "Plus values" built into every Austin-Western machine... values accumulated by engineering experience that has lived close to road building and earth moving problems and practices since the first crude Austin-Western tools of 1859.

Features of design and construction "job tested" before the war... that have met the acid test of service on far-flung war fronts.

Your post-war Austin-Western machine may, or may not, resemble the model of today; but of this you can be sure... it will embody all the performance features of yesterday that have measured up to today's infinitely higher standards, PLUS everything that today is teaching us for tomorrow. More than ever it will be "Built to Outperform."

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

MOTOR GRADERS—The "99-M" and "88-M" Power Graders with their exclusive All-Wheel Drive and All-Wheel Steer, and wide assortment of attachments, are famous for their ability completely to outperform ordinary motor graders. The No. 55 is a smaller model for maintenance and light grading.



TANDEM ROLLERS—Made in 2 sizes—5 to 8-Ton and 8 to 10½-Ton. The variable weight feature enables one machine to handle a wide variety of jobs.



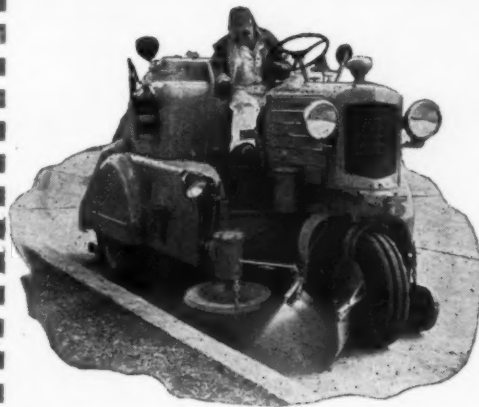
CRUSHING EQUIPMENT—Roller bearing jaw crushers and roll crushers in a wide variety of sizes. Portable and semi-portable crushing and screening plants for all purposes.



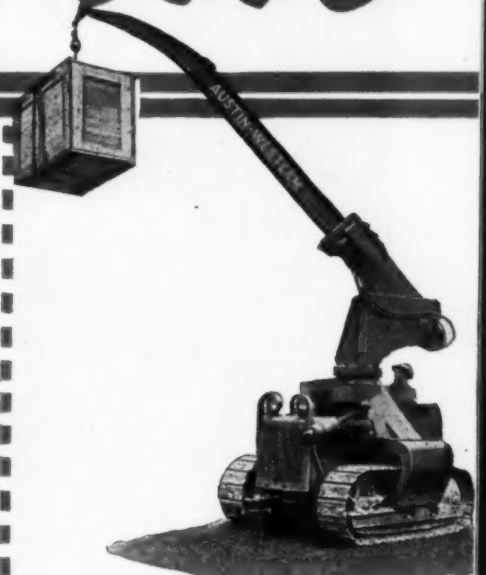
Outperform



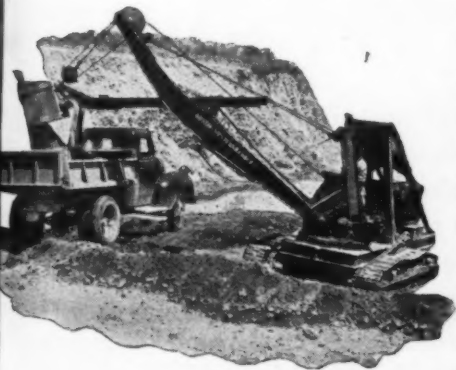
3-WHEELED ROLLERS—Made in sizes ranging from 6 to 12 tons. Gasoline or diesel engines. Hydraulic power steer. Hydraulic scarifier attachment.



PATROL SWEEPER—Compact, simplified, quick-dumping. Rear broom throws dirt directly into hopper. May be had with Leaf Broom attachment.



HYDRAULIC CRANE—Retractable-extensible boom provides ability to lift and carry maximum load under such handicaps as low doors and ceilings inside box cars, etc.



BADGER SHOVEL—Convertible to crane, dragline, piledriver, trench hoe, and skimmer. $\frac{3}{4}$ -swing design has many operating advantages.



TRAIL CARS—Hopper-bottom and side-dump types. Designed for heavy duty haulage behind powerful truck-tractors, in open pit mines, quarries, etc.



DUMP CARS—Side dump models built in capacities up to 50 yds. (level full), and 90 Tons; in standard, narrow and foreign track gauges. Also hopper type, bottom-dump Cars.

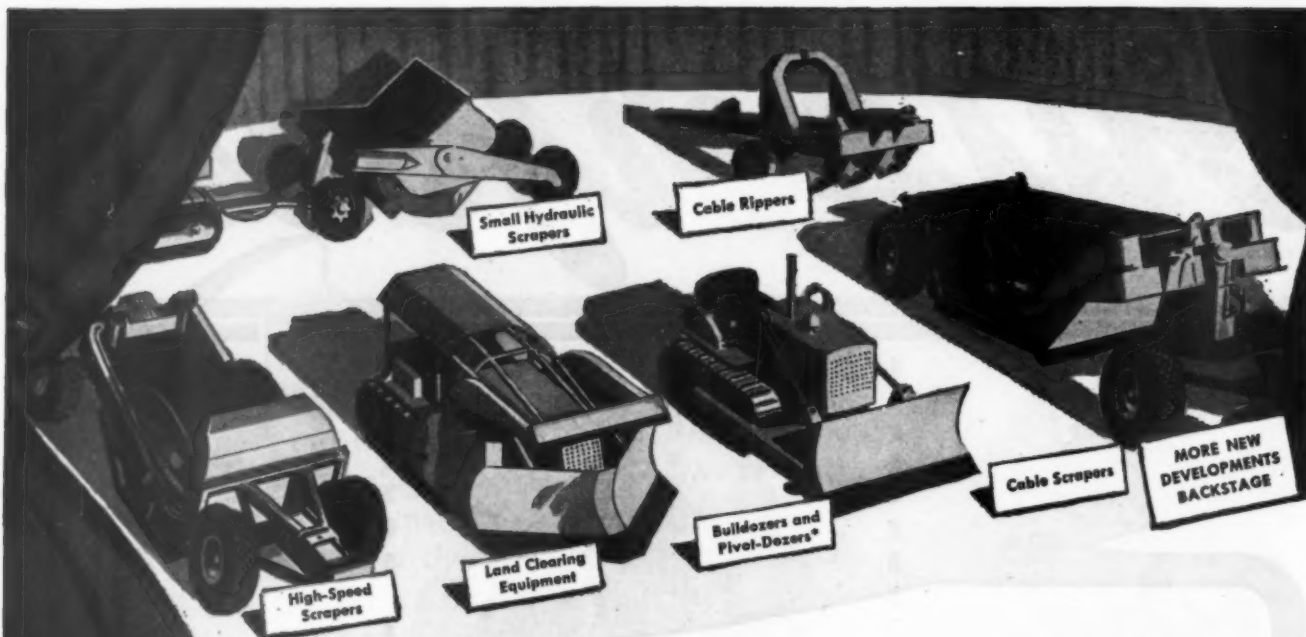
BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859



BUY MORE
WAR BONDS



LAPLANT-CHOATE'S 1945 MODEL REVIEW

*For the Benefit of Essential Users Who Want to Know
What New Equipment Will Be Available This Year*

Despite the continued heavy military demand for LaPlant-Choate equipment, there is a possibility that increasing quantities of certain models will be available this year to civilian users with WPB approval. Therefore, in order to give you as much assistance as possible in planning your 1945 equipment needs, we are presenting a review of current LaPlant-Choate models scheduled for production early in '45.

Naturally space won't permit showing you "the complete cast" here because LaPlant-Choate is building over 30 different models of earthmoving and land clearing equipment—both cable and hydraulic operated—for use with all sizes of "Caterpillar" track-type and high-speed, rubber-tired tractors. However, your La-Plant-Choate "Caterpillar" distributor, who has been selling and servicing dependable LaPlant-Choate equipment for over 20 years, will gladly give you full information. See him today! LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

*Trade-Mark applied for

LAPLANT-CHOATE

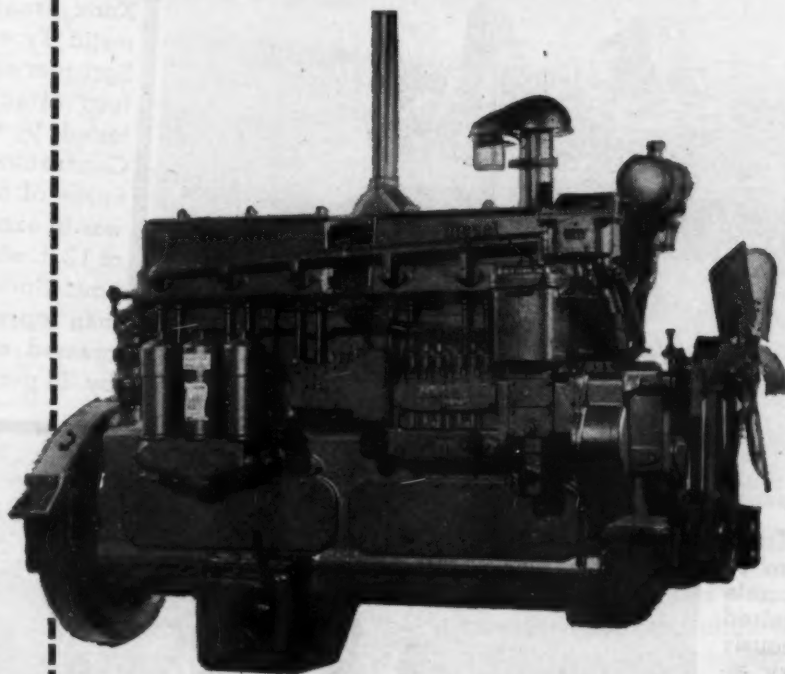
Earthmoving and Land Clearing Equipment



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FIRST THING TO

THINK ABOUT...



THEN THE FIRST THING

YOU CAN FORGET

The engine—heart of the tractor, motor grader, shovel, dragline, compressor, crusher, dredge, electric set—is decidedly the first thing to consider when setting out to buy equipment for the great era of construction work that awaits the “Go” signal.

Pioneer of Diesel engines for tractors and other earthmoving equipment, “Caterpillar” Diesels have undergone more than thirteen years of grueling tests and engineering refinements. They’ve won their stripes for dependable service on every fighting front; and they’ve rolled up mighty records on thousands of construction tasks.

*These simple, husky engines are strictly work engines.** Correctly designed, carefully manufactured, and free from ordinary operating adjustments, they

can virtually take care of themselves. With the “Caterpillar”-built fuel injection system, their fuel economy is one of their most-talked-of features. Maintenance costs over the years are unbelievably low—for these engines are given every possible protection against wear. They operate efficiently in frigid cold or torrid heat; in the rarefied atmosphere of high altitudes or at sea-level conditions.

Prompt and efficient “Caterpillar” inspection, repair and parts service is always near at hand. While the war has “made holes” in many distribution-and-service systems, the nation-wide “Caterpillar” service-dealer organization has remained intact... thoroughly equipped to keep all your earthmoving equipment rolling.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR DIESEL ENGINES

REG. U.S. PAT. OFF.

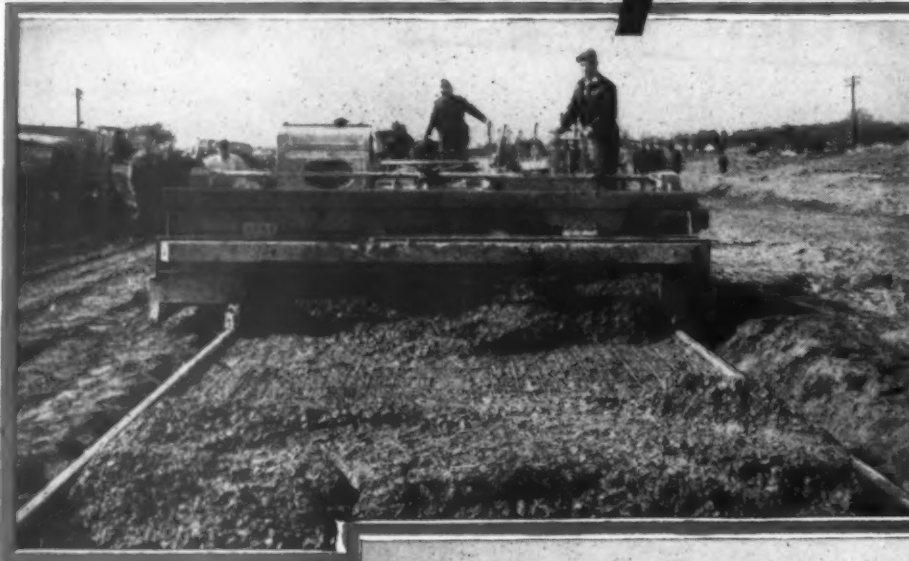


TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

ROADS AND STREETS, February, 1945

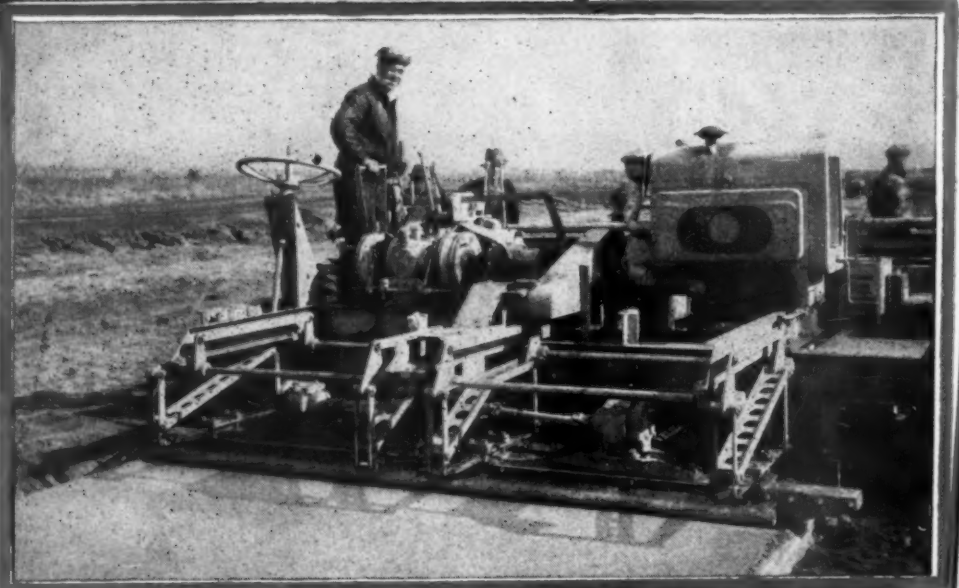
*The horsepower of “Caterpillar” Diesel Engines is **ALL WORKPOWER**. Ratings show sustained output of a fully equipped engine—not the momentary peak performance of a powerplant stripped of fan, pumps or other necessary accessories.

Use this up-to-date

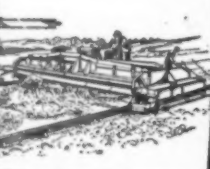


Dry, harsh, concrete paving mix being handled by Blaw-Knox Transverse-Blade Automatic Type Concrete Paving Spreader equipped with vibratory attachment. Concrete tested $\frac{1}{2}$ to $\frac{3}{4}$ inch slump. Contractor's production in spite of difficult concrete was in excess of 400 lineal ft. of 12 ft. wide slab 9" thick per hour. Spreader-Vibrator is one man operated. Vibration increased strength of concrete by 25 per cent.

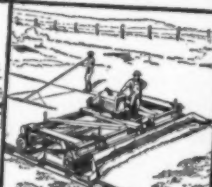
View behind Blaw-Knox Spreader-Vibrator shown in upper photograph. Concrete has been spread to required elevation and simultaneously compacted by vibratory attachment. Note uniformly smooth surface behind vibrator. Blaw-Knox Finishing Machine worked closely behind Spreader-Vibrator and kept pace easily. Cores drilled from completed pavement showed no honeycomb at bottom of slab or at joints and no excess mortar at surface of pavement.



BULK CEMENT PLANTS



PAVING SPREADERS FOR AIRPORTS AND ROADS



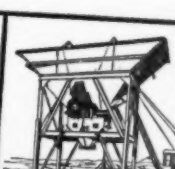
FINISHING MACHINES FOR AIRPORTS AND ROADS



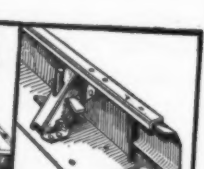
CONCRETE BUCKETS



CLAMSHELL BUCKETS



AGGREGATE BATCHING PLANTS



PAVING FORMS FOR AIRPORTS AND ROADS

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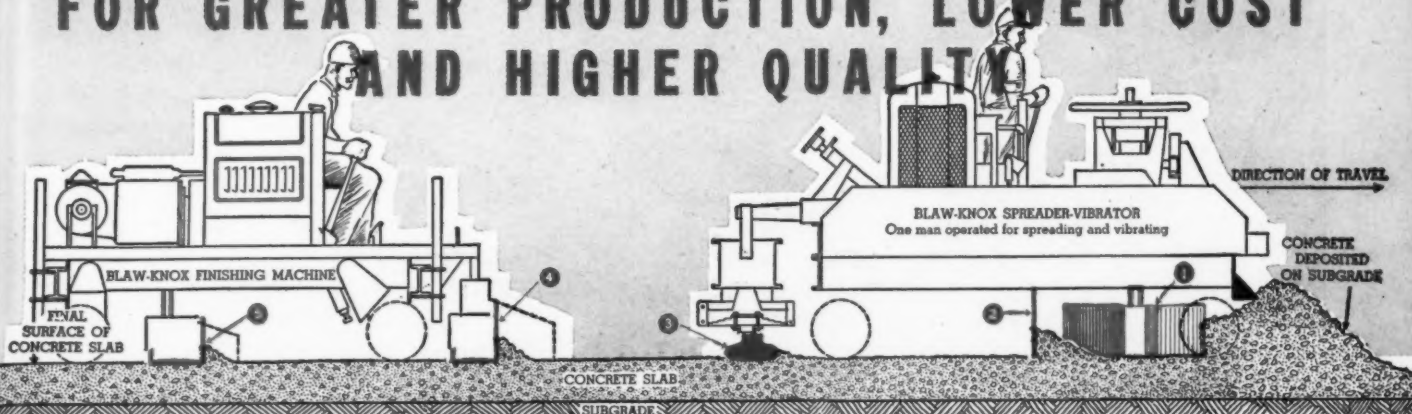
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paving method

FOR GREATER PRODUCTION, LOWER COST
AND HIGHER QUALITY



- 1 Automatic Transverse Spreading Blade spreads concrete transversely and at the same time pushes excess concrete ahead of machine; adjustable for spreading height.
- 2 Strike-off shapes concrete to required height and crown allowing slight excess for compaction by vibrator; strike-off is hydraulically adjustable for elevation.
- 3 Vibratory attachment compacts concrete simultaneously with spreading operation; vibrator is spring suspended and does not rest on side forms. All vibratory effect is transmitted directly to the concrete. Vibrator is controlled by spreader operator and leaves slight excess of concrete for finishing machine.
- 4 Finishing Machine front screed strikes off excess of concrete to exact grade and crown. Finisher has easy and rapid operation; follows close behind Spreader-Vibrator.
- 5 Rear screed of Finishing Machine performs final finishing and smoothing operation.

The method of paving construction illustrated has been proved on hundreds of miles of concrete paving construction for roads and airports.

The dry and harsh concrete mixes frequently specified by engineers for modern pavements can be spread, compacted and surfaced most rapidly and efficiently by the combination of the Blaw-Knox Transverse-Blade Type Automatic Concrete Paving Spreader equipped with vibratory attachment and the modern Blaw-Knox Finishing Machine.

The Spreader-Vibrator spreads the concrete to the required depth and at the same time compacts the concrete by vibration. The Finishing Machine follows close on the heels of the Spreader-Vibrator and does a quick and easy surfacing job. The Blaw-Knox Spreader-Vibrator teamed with the Blaw-Knox Finishing Machine handles the output of two 34-E dual drum paving mixers.

Difficult concrete is easily handled on a production basis by this up-to-date paving method and the contractor gains—in greater yardage, lower construction cost, minimum of manual operations and higher quality paving.

The Blaw-Knox Finishing Machine can also be equipped with a vibratory attachment. However, experience has shown that the paving vibrator mounted on the spreader provides better compaction, more practical operating procedure, and maximum production of paving slab. The Spreader-Vibrator always remains with the paving mixer and does not have to move back to aid in correction of high or low areas.

Blaw-Knox Spreaders and Finishers including vibratory attachments are available in standard sizes as follows: 10-15 ft. adjustable width, 20-25 ft. adjustable width.

*Your Nearest Blaw-Knox Distributor Will Promptly and Efficiently Handle
Your Inquiries for Construction Equipment.*

BLAW-KNOX

**BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY**
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NEW FOUNDLAND

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Jobs Ahead for Seabees

On the shell-pocked shores of our far-flung battlefronts American Construction Battalions and Fighting Engineers are building bases, clearing jungles, breaking construction records.

Recruited from America's great Construction Industry, these men will, with war's end, take up the tasks that await them here at home. There are concrete roads and runways to be laid—concrete

dams, aqueducts and sanitation systems to be built—reinforced concrete bridges and buildings to be erected.

Much of America's concrete is reinforced with Wickwire Spencer's "Clinton" Brand Electrically Welded Reinforcing Fabric. Its perfect wire and welds assure high, uniform tensile strength—give permanence and lasting economy to all types of concrete construction.

CLINTON WELDED FABRIC PROVIDES THESE ADVANTAGES

QUALITY

Automatic machines accurately fix members at right angles to coincide with lines of stress in concrete. There are no clips or ties to break or come undone.

CONVENIENCE

Available in a wide range of styles both in gauge and spacing. Delivered cut to size for easy storage, handling and use.

PERFORMANCE

Years of experience show that when concrete construction jobs are reinforced with Clinton Fabric maintenance costs are remarkably low.

ECONOMY

Speeds handling, reduces hazards, saves time and expense—even on tough, circular reinforcement jobs.

STRENGTH

Ultimate tensile strength of not less than 70,000 lbs. per sq. inch in accordance with A.S. T.M. Serial Designations A 82-34 and A 185-37.

UTILITY

Clinton Welded Fabric has been used successfully and economically in every form of reinforced concrete construction.

WICKWIRE SPENCER STEEL COMPANY

500 FIFTH AVENUE, NEW YORK (18), N. Y.

Abilene • Buffalo • Chattanooga • Chicago • Detroit • Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester



Highway Blocked by snow?



... each individual counts the cost to himself!

The farmer, stuck in a snowdrift with a load of hogs in his truck, wants to know why the road is not cleared. The man down the side road with the sick wife wants to know why he is cut off from help.

The merchant in town, whose clerks are idle—the restaurateur, the oil station man, the movie house owner—have a strictly personal way of counting cost.

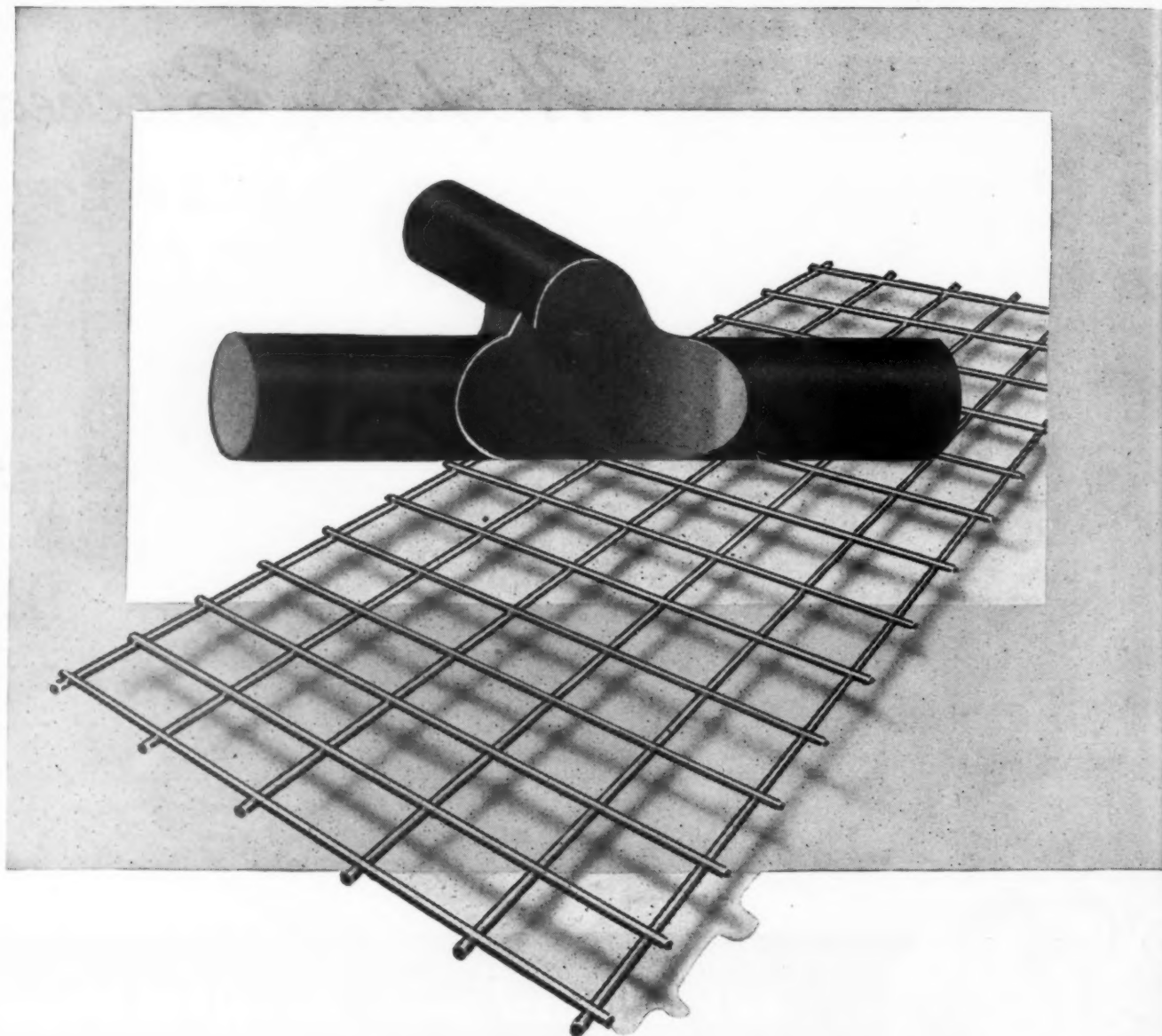
Highway authorities can handle road conditions satisfactorily in snowy weather with SNOGO equipment. It is poor economy to be without such equipment during the long months when snow is a constant traffic hazard.

SNOGO throws snow off the road, cutting cleanly and evenly through the drifts. No banks are built up to narrow traffic lanes and later drift or melt onto the road. No blanket of snow is left to thaw and freeze into dangerous ruts. SNOGO lengthens the life of the highway paving. It throws the snow well off the road, minimizing the weathering effects of melting snow. SNOGO does a thorough job, and with SNOGO it is not necessary to clear the roads as frequently. Check into what SNOGO can do to give you better winter snow clearance and road protection.

KLAUER MANUFACTURING COMPANY • DUBUQUE, IOWA

SNOGO

A SNOGO For
EVERY BUDGET



IT'S THE PERFECT TRUSCON WELD
that guarantees the permanence!

forced highways outlive their bonds by many years! This is the perfectly-integrated union that holds each wire contact with a grip that cannot be broken or loosened. Millions of yards of this famous Truscon Welded Steel Fabric have built long life and low upkeep into concrete highways across America.

Truscon Welded Steel Fabric Assures:

Resistance to cracking during setting period
 Tensile strength against subgrade friction
 Resistance to cracking due to warping

Resistance to development and opening of cracks
 Resistance to slab separation
 Decrease of spalling and disintegration

You can be *sure* that Truscon Welded Steel Fabric Reinforcement, and associated Truscon Steel roadbuilding products, will build better roads for the communities you serve, and greater prestige for you.



TRUSCON STEEL COMPANY, Youngstown 1, Ohio • *Subsidiary of Republic Steel Corporation*

TRUSCON

WELDED STEEL FABRIC
• Covers the Continent •

GALION



**ROLLERS and MOTOR GRADERS for
ROAD and AIRPORT CONSTRUCTION**

The GALION IRON WORKS & MFG. CO. Galion, Ohio

Preformed wire rope

SAVES TIME 3 WAYS

Men in every industry are changing to Preformed wire rope because they have discovered it saves time in three important ways.

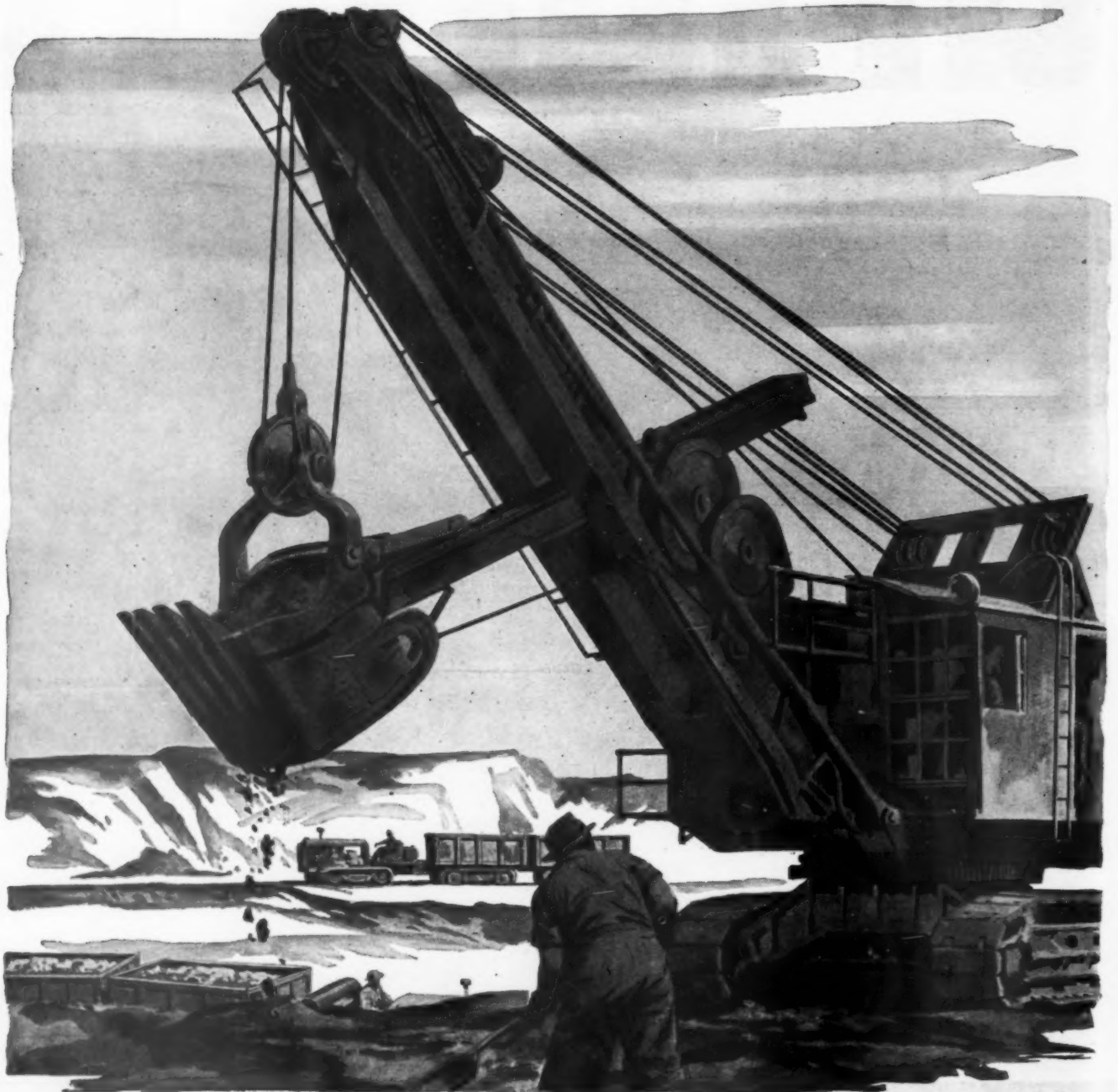
First, it cuts time of installation at least in half because it is so easy to handle, so free from kinking.

Second, Preformed saves time in operations. It is so flexible it can be spooled at higher speeds.

Third, it reduces time-out for shutdowns and replacements because it lasts longer.

These are potent reasons why men searching for new ways to save time prefer Preformed wire rope.

ASK YOUR OWN SUPPLIER FOR PREFORMED WIRE ROPE

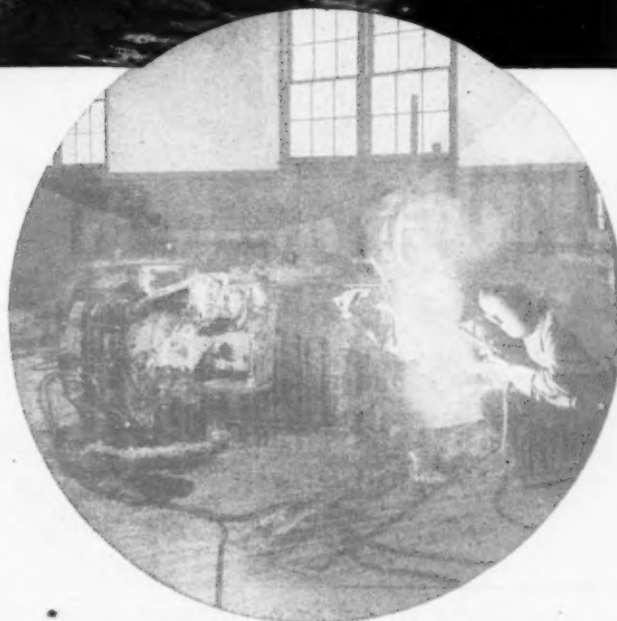


ARE YOU READY FOR THE BIG PROGRAM?



The big, proposed construction program may break anytime! It is on the "must" list to cushion the shock of reconversion . . . at the same time provide the good roads, streets and airports needed for increased post-war traffic.

Are you ready? Is your present equipment in condition to handle tough work? You may have to rely on it. Until war and rehabilitation needs are satisfied . . . new tractors and other road machinery will be on the "hard-to-get" list.



While there is time . . . put your outfit in A-1 condition. Let your Allis-Chalmers dealer lend a hand. Make full use of his skilled mechanics, modern tools and facilities. Get ready for the big program . . . NOW!

WATCH 2-CYCLE
The Modern Diesel
For Modern
Road Builders

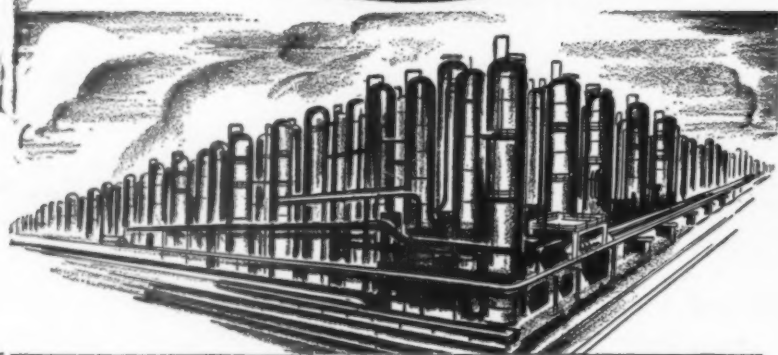
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

*Fight to
Victory with
War Bonds*

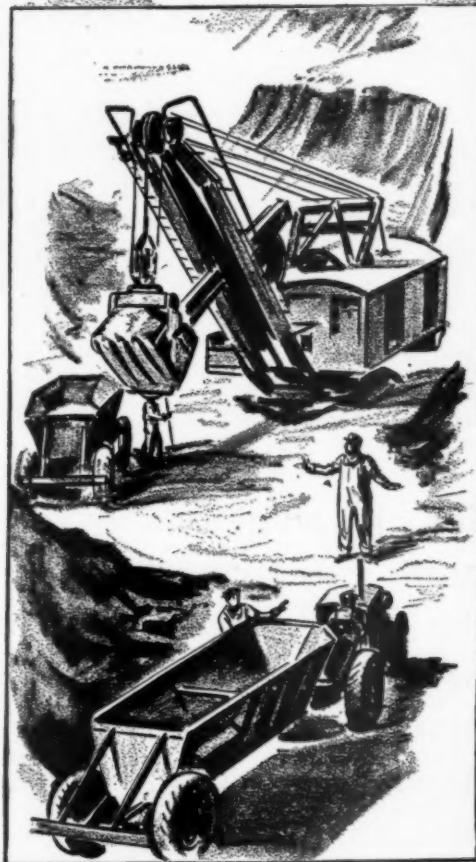
Do you know that . . .



SINCLAIR PRODUCING OIL WELLS IF PLACED END UNDER END WOULD REACH TO THE CENTER OF THE EARTH—MORE THAN 3,500 MILES. SINCLAIR RANKS AMONG THE LARGEST PRODUCERS OF CRUDE OIL.



SINCLAIR'S 10 GREAT REFINERIES, IF MASSED TOGETHER, WOULD COVER AN AREA OF 2,300 ACRES—THE APPROXIMATE AREA OF A CITY OF 100,000 POPULATION. THESE REFINERIES MANUFACTURE A FULL LINE OF QUALITY PETROLEUM PRODUCTS FOR ALL MILITARY, INDUSTRIAL AND GENERAL USES.



FOR SAFE LUBRICATION OF EQUIPMENT UNDER HEAVY DUTY OPERATION SINCLAIR PROVIDES SPECIALIZED MOTOR OILS AND GREASES . . . ALSO TEN-OL 200 PREPARED SPECIFICALLY FOR DIESELS, DIESEL-POWERED BUCKETS, SHOVELS, AND BULLDOZERS.

SINCLAIR IS EQUIPPED TO SERVE YOU BETTER!

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

ROADS AND STREETS, February, 1945

OLDES

Another Great Leader in a Great Line...FWD's Model SU



Famous 5-Tonner Tops

\$ 75,000,000⁰⁰ ENDORSEMENT

When a single model of a heavy duty truck is purchased in volume reaching a total dollar value of \$75,000,000.00 in less than four years time, it rightfully gains leadership in its field. FWD's Model SU has won an extraordinary recognition—the endorsement of motor truck buyers exemplified in \$75,000,000.00 worth of trucks bought and used since 1940.

It is significant, too, that in a comparatively brief period of years this single model FWD has a background of \$75,000,000.00 in manufacturing experience as well. In every sense it is a great leader in a great line of trucks.

The FWD model SU represents the most advanced development of the four-wheel-

drive principle originally pioneered and sponsored by FWD since 1910. It is eminently qualified in every element of design and construction to render service of a character and extent far beyond that of any other truck.

More than ever before essential industries and motor transport organizations rely on Four-Wheel-Drive hauling power to do more work—cover more miles—at lower cost for gas—oil—tires—replacements.

When your need is dependable all-season, all-weather hauling power—look to FWD's—a great line of trucks.

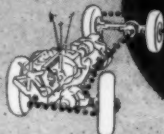
THE FOUR WHEEL DRIVE AUTO CO.

Clintonville, Wisconsin

Canadian Factory: KITCHENER, ONT.

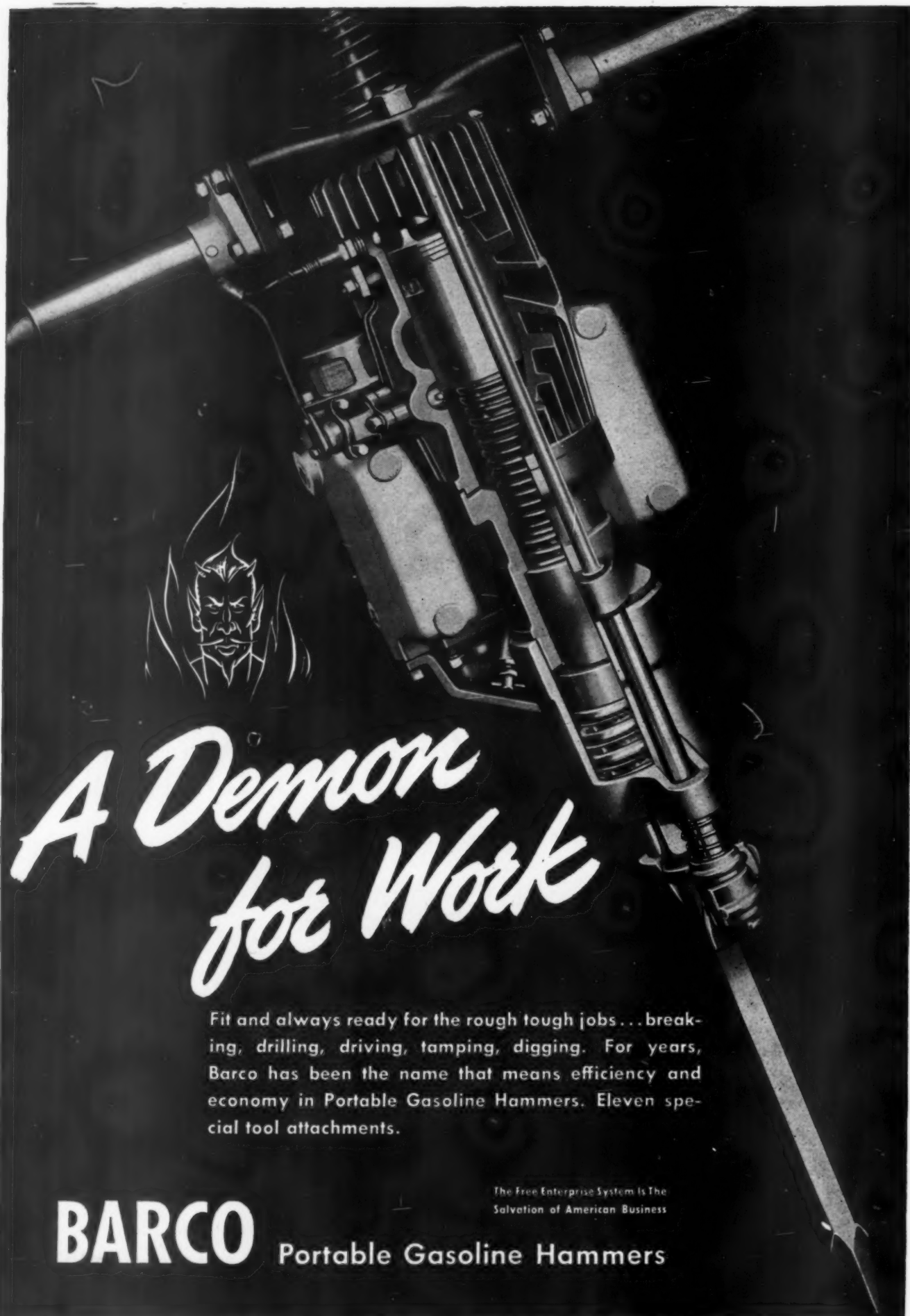


OLDEST AND ORIGINAL EXCLUSIVE



TRUCKS

BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS



A Demon for Work

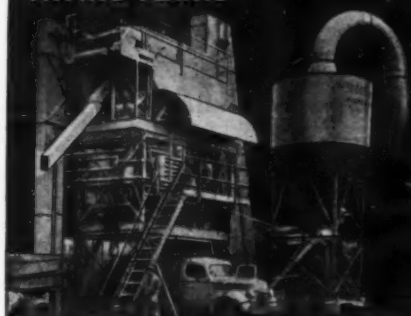
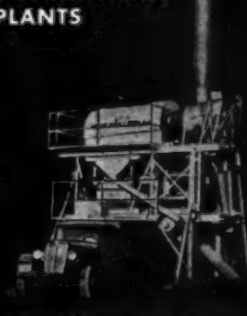
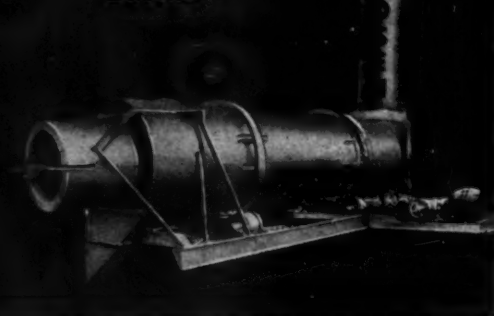
Fit and always ready for the rough tough jobs... breaking, drilling, driving, tamping, digging. For years, Barco has been the name that means efficiency and economy in Portable Gasoline Hammers. Eleven special tool attachments.

BARCO Portable Gasoline Hammers

The Free Enterprise System is The
Salvation of American Business

BARCO MANUFACTURING COMPANY, NOT INC., 1815 Winnemac Ave., Chicago 40, Ill. • In Canada: The Holden Co., Ltd., Montreal, Can.

ROADS AND STREETS, February, 1945

**ASPHALT
PAVING PLANTS**

**ROAD-
MAINTENANCE
PLANTS**

**AGGREGATE
DRYERS**


Record Breaking! MADSEN EQUIPMENT

BITUMINOUS MIXING PLANTS
BATCH CAPACITIES—500 to 6000 lbs.
RECORD (3000-lb. Plant)—2414 tons in
 12 hours reported by Lewis Construction
 Co., on the Marine Base at El Toro, Calif.

BITUMINOUS MIXING PLANTS
BATCH CAPACITIES—500 and 1000 lbs.
MIXING SPEED—40-second cycle.
FEATURES—Jack Erection; Unit-Power
 Transmission; Asphalt Pressure-Injection.

COUNTER-FLOW TYPE DRYERS
SIZES—32- to 72-in. diam. All lengths.
FEATURES—Unit-Power Transmission;
 Flexible Ring-Sprocket Drive; Oversize
 Tires and Trunnions; All-Welded Shell.

**ROAD PUG
TRAVEL-MIX
MACHINES**

**JOHNSON
FLOAT
FINISHERS**

**BATCHERS,
BINS AND
BUNKERS**

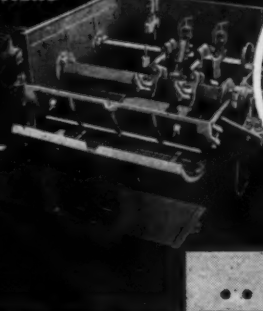

FOR THE ROAD BUILDER-CONTRACTOR

FOR OIL-MIX, SOIL CEMENT & BASE
CAPACITY per hour—200 to 550 tons.
REPORTED by Phoenix Construction Co.
 7920 tons in 20 hrs. to Calif. specifications.
METERED OIL—In ratio to travel speed.

FOR MECHANICAL FLOAT FINISHING
WIDTHS—convertible from 10 to 18 feet.
SPEED—3065 lineal feet by Roy Houck,
 Oregon. Consistently finishes pavement
 to .05 inch, or less, variation in 10 feet.

TRUCK LOADING BATCHERS, ALSO
 Proportioner Plants; 1- to 6-unit Bins
 and Bunkers; Screening Plants; Central
 Mixing Plants; other batcher equipment.
CAPACITIES—From 25 to 400 tons.

**ROLL-TAMP
COMPACTORS**

**PUG MILL
MIXERS**

**WEIGH
BATCHERS**


*Fill out
and mail*

Rubber-tired rollers have dual
 wheels with oscillating axle
 on walking beam. It kneads
 the soil as it compacts.

Pug Mill Mixers, weigh batchers,
 and all types of bin gates
 and feeders are available at
 Madsen Iron Works.

MADSEN IRON WORKS
HUNTINGTON PARK, CALIFORNIA

... FOR MORE INFORMATION

MADSEN IRON WORKS
HUNTINGTON PARK, CALIF.

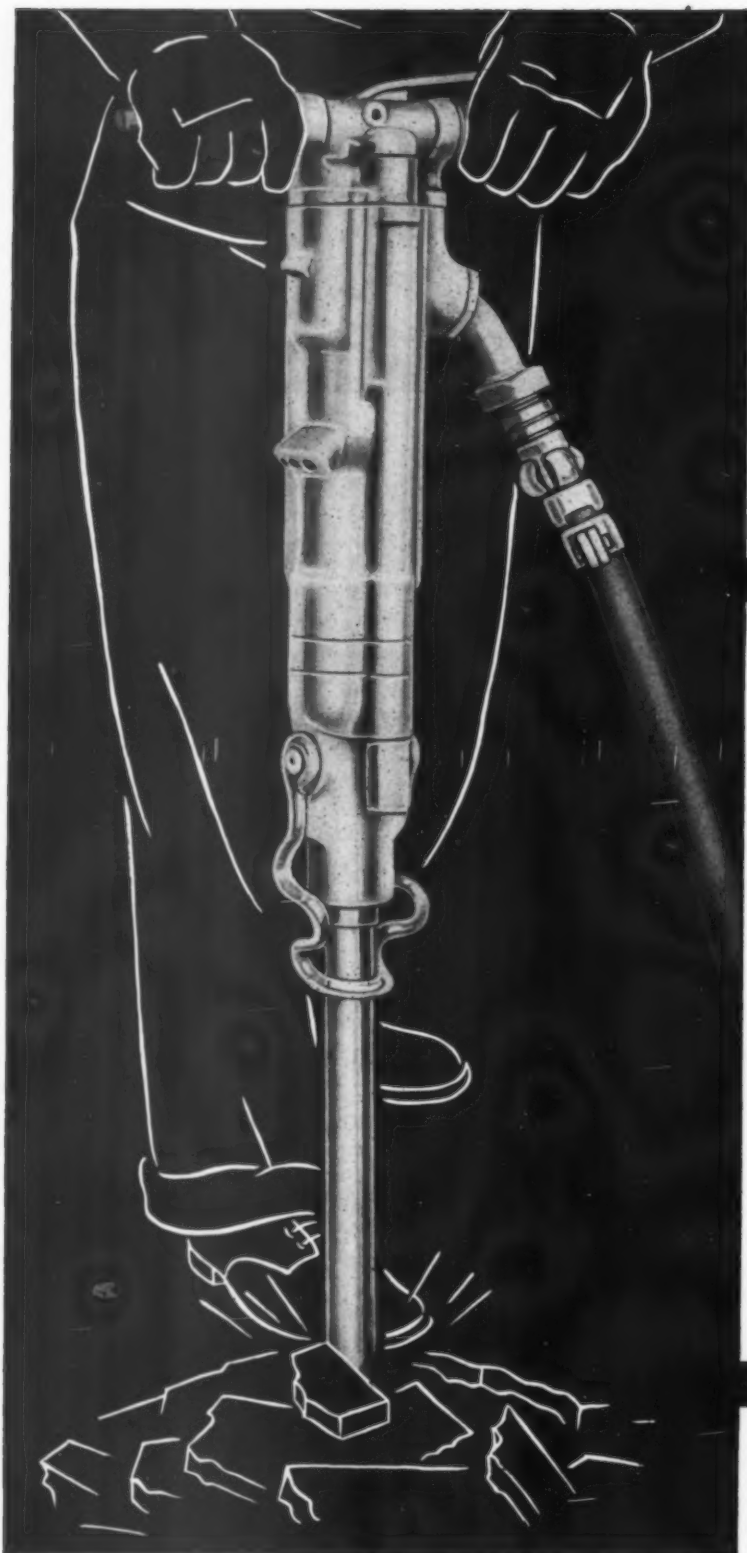
Send information on the items
 checked.

- | | |
|---|---|
| <input type="checkbox"/> Asphalt Plants | <input type="checkbox"/> Road Pugs |
| <input type="checkbox"/> Maintenance Plants | <input type="checkbox"/> Batchers |
| <input type="checkbox"/> Float Finishers | <input type="checkbox"/> Bins & Bunkers |
| <input type="checkbox"/> Aggregate Dryers | <input type="checkbox"/> Compactors |
| <input type="checkbox"/> Pug Mill Mixers | <input type="checkbox"/> Weigh Batchers |

NAME _____

COMPANY _____

ADDRESS _____



***streamlined
design . . .
minimum
kick back!***

CP-115 DEMOLITION TOOL

WEIGHING only 59 lbs. with latch type retainer, the new CP-115 Demolition Tool gives outstanding performance for medium weight tool. Valve actuated, it operates with smooth efficiency — and minimum kick back. Full cushioning eliminates need for side rod springs — protects front head from punishment in "breaking through". Added safety feature is a gooseneck air inlet, so placed that swing of hose cannot catch operator's hand. Write for full data on the new CP-115 Demolition Tool.

CP-115 Demolition Tool is one of a complete line of CP Demolition Tools, Rock Drills, Sheeting Drivers and Spike Drivers. Write for detailed information.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL  COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

TIME *is money in road building*

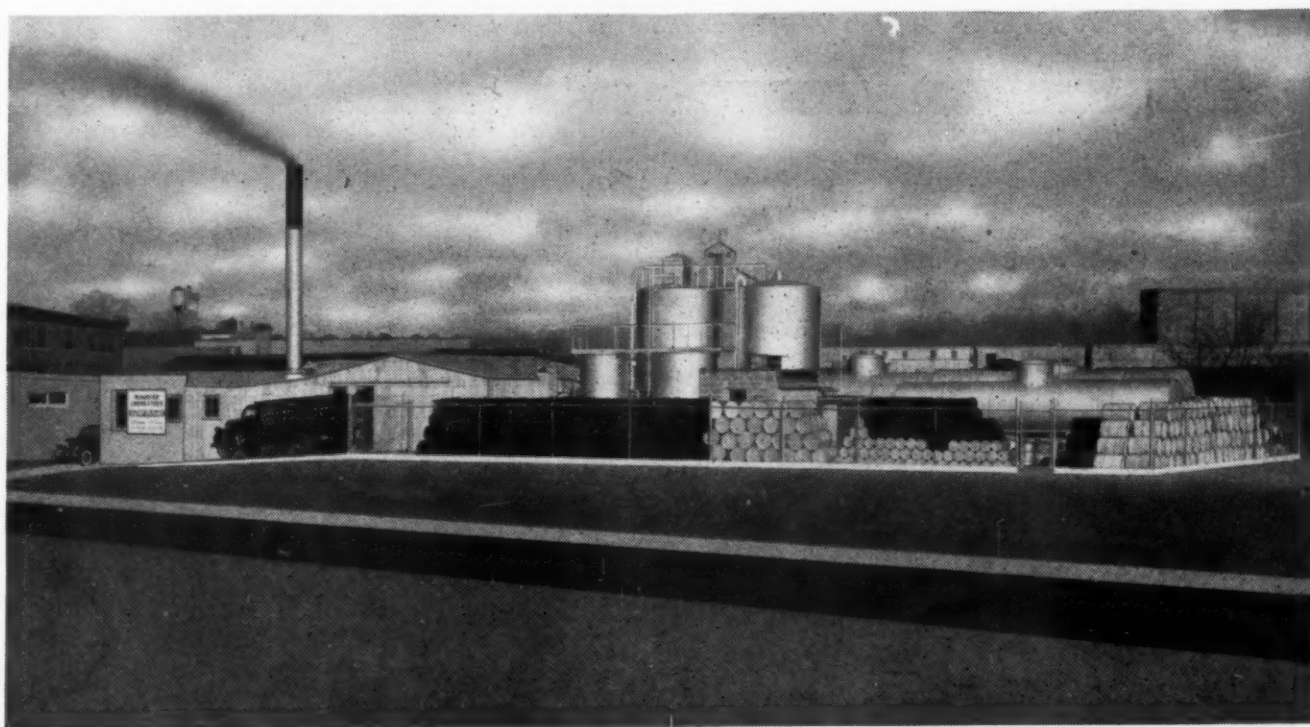
It's time NOSTRIP, the *tested and approved** admixture for tar and asphalt, went to work for you! Time that NOSTRIP-treated bitumen saved you time and labor dollars on the job . . . putting you days ahead of schedule . . . extending your road season six weeks! Your first drum is our best salesman; it proves an invaluable time and money saver because:

The coated aggregate can be laid at any temperature above Zero; heating or drying is unnecessary. It laughs at water, easily passing the Distilled Water and Nicholson Stripping Tests. The treated bitumen adheres permanently to any road surface, wet or dry . . . even in rainstorms! NOSTRIP halves blading and mixing time, and

used with R. C. cutbacks speeds construction of airport runways, roads and shoulders. It is ideal for bank run gravel or beach sand in coastal regions. A boon to Travel Plants, NOSTRIP doubles adhesion. With hydrophyllic aggregates, lime or other additions are never needed.

*You do not experiment when using NOSTRIP. It has proven itself in all types of installations for four years and is now used in thirty-three states! Write for laboratory and field test reports, and we will send unbiased testimony from State Highway Officials and contractors . . . You be the judge!

★ Our large modern plant in Jamaica, N. Y., (below) can produce enough NOSTRIP to treat 1,000,000 gallons of asphalt per day.



your first drum



is our best salesman!

THE ALL-YEAR ROAD MATERIAL
NOSTRIP
 AN ADMIXTURE FOR TAR AND ASPHALT

MAGUIRE INDUSTRIES, INCORPORATED • NOSTRIP DIVISION • 122 E. 42nd ST. NEW YORK, 17, N. Y.

ROADS AND STREETS, February, 1945

WHEN WINTER CONSTRUCTION CALLS FOR ONE OR ALL THREE..

Cleaver-Brooks equipment provides steam, heat or hot water — fast, efficiently and at low cost — for a wide range of cold weather needs, such as —

- heating asphalt, road oils, bituminous materials in tank cars and storage tanks.
- heating water for central mixing plants.
- thawing and heating aggregate in stock piles or bins — for winter concreting.
- steam for cleaning machinery, thawing frozen ground, operating steam hammers, heating buildings and offices, and other uses.

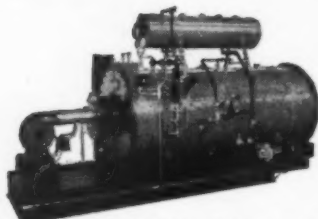
Write for bulletins and complete information on the entire line of Cleaver-Brooks equipment for cold weather construction and maintenance.

CLEAVER - BROOKS COMPANY

5106 North 33rd Street • Milwaukee 9, Wisconsin



AUTOMATIC STEAM PLANTS



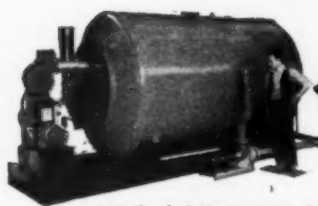
Completely self contained; highly efficient; require only simple piping connections to place in operation. Fully automatic fuel-oil burner; condensate recovery and feed water pumping system; no stack needed, sizes ranging from 20 to 500 h. p.; pressures 15 to 200 lbs.

PORTABLE PUMPING BOOSTERS



Heats bituminous material by direct firing in one operation, loading directly to distributor, relay truck or returning to tank car. Built in two sizes, truck mounting or 4-wheel trailer.

HOT WATER BOOSTERS



Oil-fired; fully automatic or manual operation; no licensed engineer needed to operate; two capacity sizes: 3000 gals. storage tank providing 1600 gals. of water heated 150° F. per hour; 1500 gals. storage tank providing 800 gals. of water heated 150° F. per hour.

PORTABLE TANK-CAR HEATERS



Available in 2 and 3 tank-car sizes. Oil-fired with exclusive four-pass flue travel; dry-coil steam condensate return under pressure — no water or heat loss. An all-purpose unit — provides a portable source of steam wherever needed.



Cleaver-Brooks

PIONEERS AND
ORIGINATORS OF

TANK CAR HEATERS • BITUMINOUS BOOSTERS • AUTOMATIC STEAM PLANTS

High Speed EARTHMOVING

ON L-O-N-G AND SHORTER HAULS

MOVES WORLDS OF EARTH
AT A LOWER COST



Combines Power and Speed With Positive Steering Control

Powered by a heavy duty diesel with four speeds forward and a reverse gear, Woolldridge Terra-Cobras attain travel speeds up to 21 M.P.H. on either short or long stretches. Surplus rim pull permits fast acceleration in a short distance and provides ample power to pull up comparatively steep slopes—fully loaded without a "pusher." Regardless of whether it is loading, traveling, spreading or turning, the Terra-Cobra maintains a fixed direction of travel due to positive two-wheel hydraulic steering control. Full traction and power is constantly applied and maintained on BOTH drive wheels, at all times . . . even on sharp turns. As no fatiguing effort is required to handle the Terra-Cobra, full production and higher average yardages can be expected from each operator on every shift. To combine speed with safety on your earthmoving operations rely on Woolldridge Terra-Cobras. Investigate fully, today.

WOOLDRIDGE MANUFACTURING CO. SUNNYVALE, CALIFORNIA

No Danger of "JACKKNIFING"

It is unnecessary to slacken speed when traveling, spreading or turning in order to maintain safe control of a Terra-Cobra, as there are no steering clutches to fight nor individual brakes to grab. Positive two wheel steering eliminates any possibility of "jackknifing."

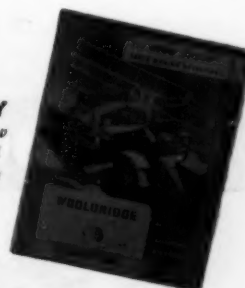
WOOLDRIDGE

TERRA COBRA

SELF-PROPELLED EARTHMOVERS

WRITE TODAY

For your copy of new Bulletin giving full details on Woolldridge Terra-Cobras. Ask for Bulletin TA-425.





How a Bucket Loader Can Save Money *the Year 'Round*

Truck loading time is cut to a minimum by the continuous operation of a Barber-Greene Bucket Loader. But more than that, the B-G Loader has year-round utility . . . can hustle along some construction or maintenance job each season.

★ The B-G Loader yields higher yardage, with less power, less weight, and less cost than any other method.

★ It can effectively handle a variety of loose materials—soil, sand, cinders, gravel or roadway debris.

★ Clean pick-up is assured with the fol-

low-up scraper that cuts to grade and does light excavating.

★ Top performance in stockpile or semi-compacted natural deposit loading, light excavating, shoulder shaping or stripping to grade can be maintained with the 12 selective crowding speeds.

★ By substituting a B-G Snow Loader boom, the B-G Loader can be used for street snow removal.

Ask your B-G representative for details on the versatility and economy of B-G Bucket Loaders. Barber-Greene Company, Aurora, Illinois.

Barber-Greene



Constant Flow Equipment



"TANKAR" STEAM HEATER



"Tankar" Steam Heater can be used to clean equipment.



LITTLEFORD "TANKAR" STEAM HEATER CUTS UNLOADING TIME

The "Tankar" Steam Heater is the fastest steam producing unit devised for the unloading of bituminous material from tank cars. This "Tankar" Steam Heater cuts the heating of tank cars by one-third.

Littleford "Tankar" Steam Heaters can also be used to clean construction equipment, motors, platforms, floors, also for stripping tanks.

To speed up highway and road construction programs, why not use the equipment that will speed up the job of unloading bituminous material from their storage tanks?

For better road construction, use the best equipment—use Littleford Road Maintenance and Construction Units.



LITTLEFORD

LITTLEFORD BROS., INC.

454 E. PEARL ST., CINCINNATI 2, OHIO

Happy Warrior



The Buckeye Clipper enjoys its war-time role of helping the Allies on all war fronts, judging by the endless gruelling jobs it does *without complaint*, according to eyewitness accounts. A T/4 in the Army Engineers hit the nail on the head when he called the Clipper "A Happy Warrior."

Every Clipper is equipped with Mevac Vacuum Power Control which speeds up and smooths out crowd, hoist, swing and travel, is easier on the transmissions and engine and greatly reduces operator fatigue. Proved in war, you'll profit with Clippers in the post-war era. Send for 24-page book — "The Age of Clippers."



Quickly Convertible to Shovel, Trench Hoe, Dragline

Built by Buckeye

Buckeye Traction Ditcher Co., Findlay, Ohio



Convertible Shovels



Trenchers



Tractor Equipment



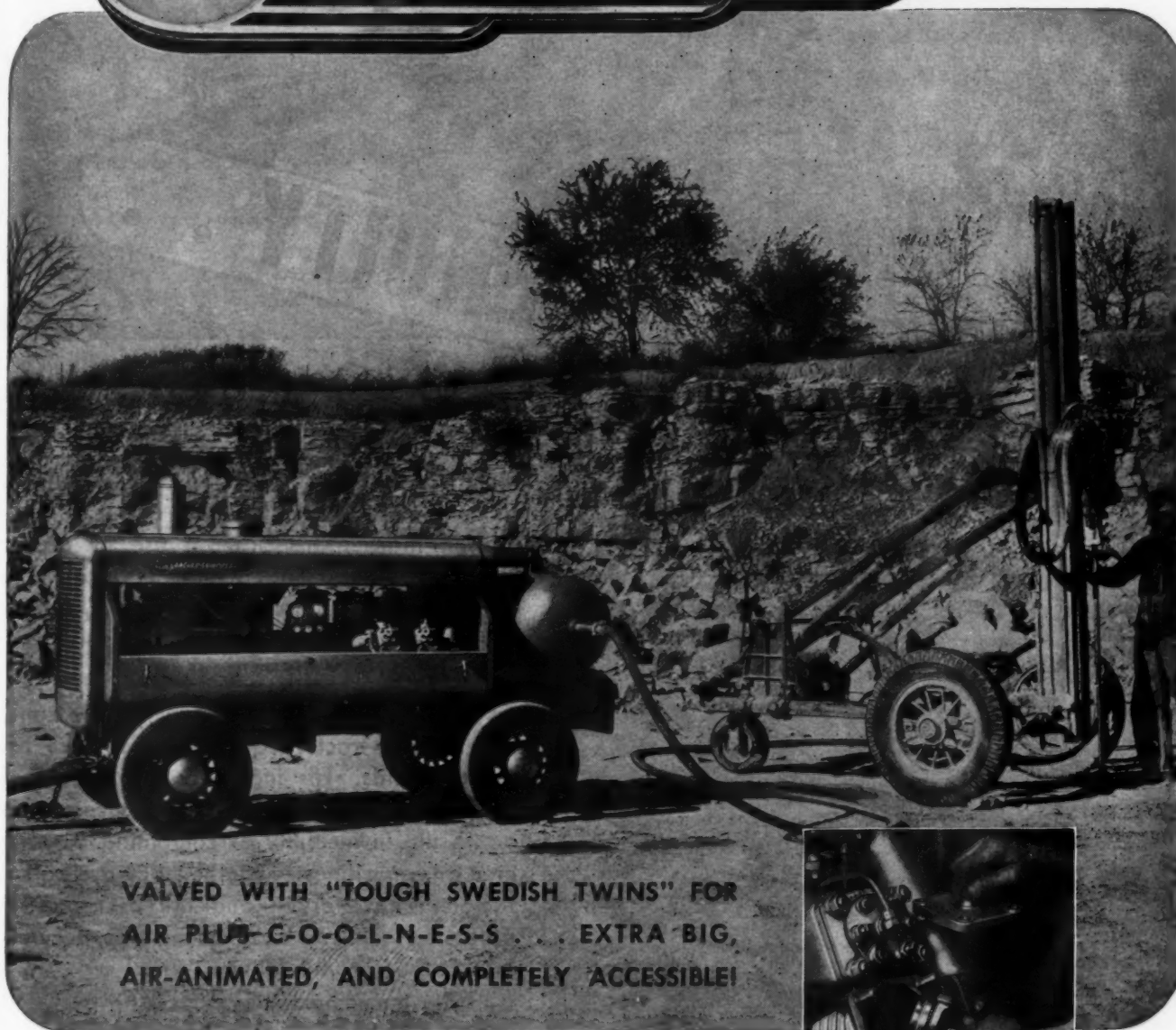
Road Wideners



R-B Finegraders



Spreaders

**AIR
PLUS**
JAEGER COMPRESSOR


VALVED WITH "TOUGH SWEDISH TWINS" FOR
AIR PLUS C-O-O-L-N-E-S-S . . . EXTRA BIG,
AIR-ANIMATED, AND COMPLETELY ACCESSIBLE!

The low temperature and minimum of oil vapor and condensation in the air delivered by "Air Plus" Compressors are evidence of the efficiency of Jaeger's "Tough Swedish Twin" Valves, horizontal fin-cooled cylinder design and an inter-cooler system which automatically unloads and drains during every idling period. All sizes, 60 to 500 feet.
THE JAEGER MACHINE COMPANY, COLUMBUS 16, OHIO

JAEGER
Engineered EQUIPMENT


"FLEET-FOOT"
Crane-Loaders



"SPEEDLINE"
Concrete Mixers



"SURE PRIME"
Contractors Pumps

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS
PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS,
AGITATORS—JAEGER HOISTING ENGINES, TOWERS



Bulldozers are taken in water deeper than 3 ft. to drag a timber ramp to the waiting maws of an LST.

(Engineering News-Record Photo)

APPLIED INGENUITY . .

the GI Stock in Trade



After clearing a 14 mile path through tough timber land, this Bullgrader is utilized to pull a crashed bomber back to base.

(R.C.A.F. Photo)

Nowhere is the outstanding resourcefulness of the American fighting man better demonstrated than in his brilliant use of tractor equipment in the battle areas. Typically, he has converted Bullgraders, Bulldozers, Dozer-shovels, Scrapers, etc., into decisive instruments of war.

To the American fighter in every battle zone, Bucyrus-Erie tractor equipment units are familiar friends. His ingenious application of them plus their efficient performance proves again the invincibility of combining superior men and machines. Together they are potent factors for Victory — and the best bet for profits on tomorrow's peacetime jobs. Bucyrus-Erie Co., South Milwaukee, Wis.

N-82

**BUCYRUS
ERIE**
TRACTOR EQUIPMENT

See Your INTERNATIONAL
TRACTRACTOR Distributor



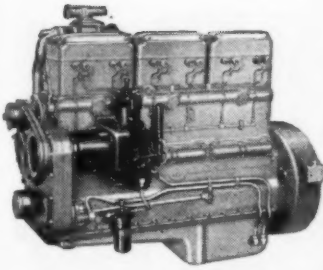
A Dozer-shovel is quickly commandeered to help unload bombs from a landing craft.

(Official U. S. Navy Photo)

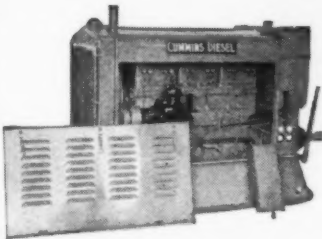


Usually used to build roads, this dual unit Bullgrader-Scraper cleans debris from a tropical beach.

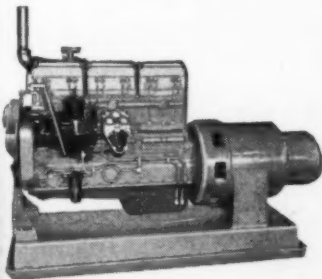
(Official U. S. Navy Photo)



The six-cylinder, 150 hp. Model HBI-600 Cummins Diesel is a portable industrial version of the Model H engine . . . the *original* high speed diesel. It is designed for heavy-duty shovels, cranes and numerous other types of wheel and track mounted dirt moving or material handling equipment in the construction and aggregates fields.



Model HP-600 Cummins Diesel is an enclosed power unit and is the same engine, basically, as the Model HBI-600, having the same horsepower rating. Like all Cummins Diesels, this model has earned acceptance among contractors and aggregates producers by its economy, quick cold-weather starting and its rugged dependability.

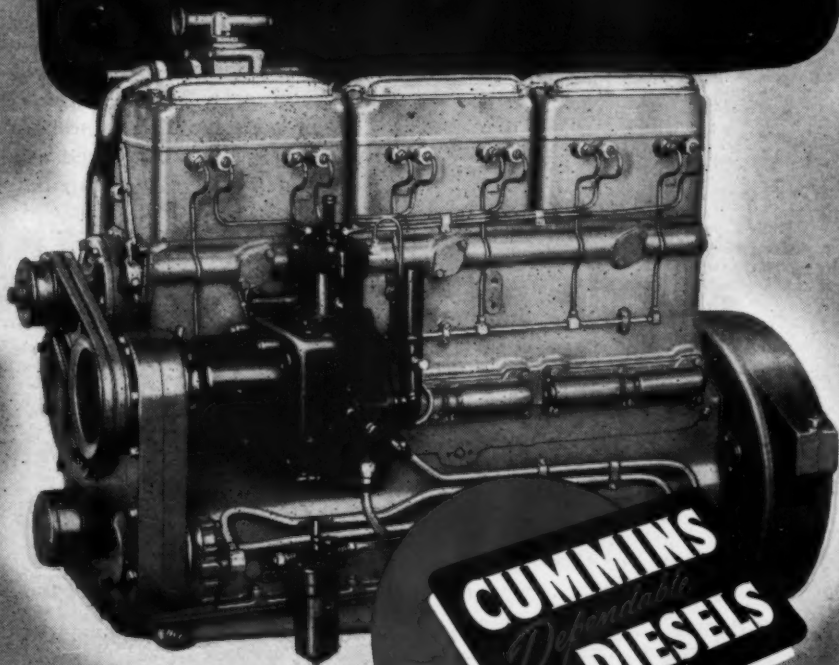


For generating service as well as for direct diesel drive, you can rely on Cummins Dependable Diesels for reliable, low-cost performance. Model HGA-601 (AC) and Model HGD-601 (DC) Cummins Diesel Generating Sets are offered with two ratings: 35 kw. at 900 rpm., and 50 kw. at 1200 rpm. Other models are manufactured in capacities ranging from 15 to 125 kw. Illustrated is the Model HGA-601.

Makes the tough jobs look easy.

If yours is a dirt moving or material handling job that demands rugged, heavy-duty power the clock around, then Cummins Diesel power is the power for you. Contractors and aggregates producers who have standardized on Cummins Diesels will attest to their low operating and upkeep cost, their flexibility and quick, cold-weather starting, their dependability, and long life . . . will tell you that Cummins Diesel power makes the tough jobs look easy. For your new equipment, plan now to specify Cummins Dependable Diesels.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.



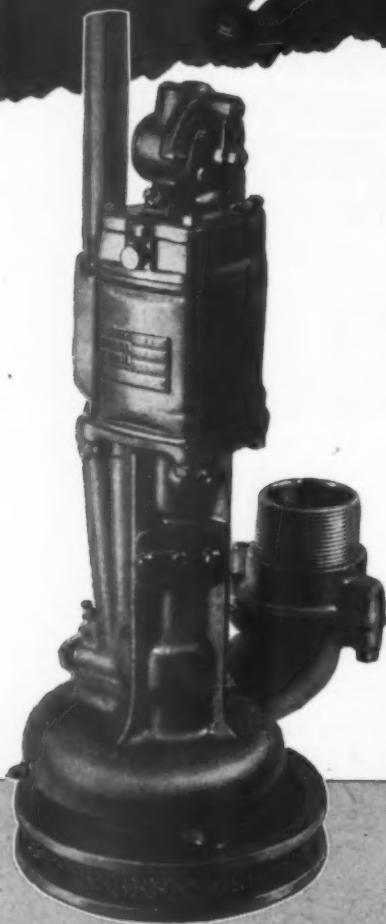
CUMMINS
Dependable
DIESELS



SINCE 1918...PIONEER OF PROFITABLE POWER.
THROUGH HIGH SPEED DIESELS

A *Thor* Team That Do a Better

Thor SUMP PUMP



Thor automatically lubricated sump pumps are designed and manufactured to operate most efficiently on the toughest jobs under the most severe, most unfavorable conditions. The Thor rotary air motor is enclosed in an air-tight, fool proof housing to assure steady operation whether partially or fully submerged. Because they are self-priming, centrifugal impeller type pumps. Thor sump pumps will operate in the dirtiest of water—in oil—in sludge or in sewerage, at peak efficiency. The variable speed throttle controls capacity and speed.

Thor Sump Pumps have a newly designed exhaust outlet feature which eliminates, (or in damp climate minimizes), shut-downs due to freezing.

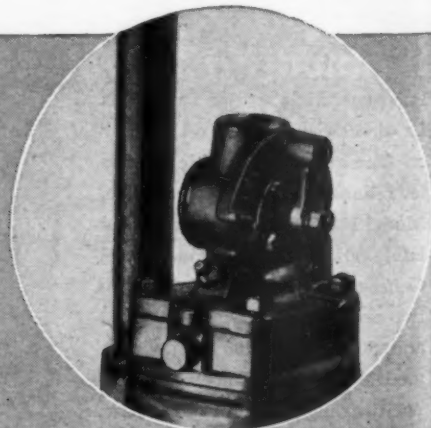
The exclusive Thor automatic lubrication system keeps all moving parts adequately lubricated at all times. For the best in sump pumps call your nearby Thor distributor today.

AUTOMATIC LUBRICATION

Live air pressure provides continuous application of grease to the impeller hub and bushing. The oil is fed from a built-in oil reservoir to the rotor blades and the cylinder bushings in a fine continuous spray.

VARIABLE SPEED CONTROL

The Thor variable speed throttle accurately controls the speed and capacity of the pump. This is a hand lever that can be set to pump many gallons per minute, or to idling speed where it pumps slowly.



Will Help Contractors Job Easier!

Thor PAVING BREAKERS

The reason for the great popularity of Thor Paving Breakers among contractors and builders is the exclusive Thor "measured air" feature which provides more power, longer life and less operating cost—in short, more work done faster and cheaper. Designed to provide the easy handling that gets tough jobs done quicker, Thor Paving Breakers are built from alloy-steel drop forgings. They have the strength, rigidity and balance, plus maximum power to do the tough jobs in minimum time with the least effort.

INDEPENDENT PNEUMATIC TOOL CO.

600 West Jackson Boulevard, Chicago 6, Illinois

New York

Los Angeles

WHAT THOR "MEASURED AIR" MEANS TO YOU

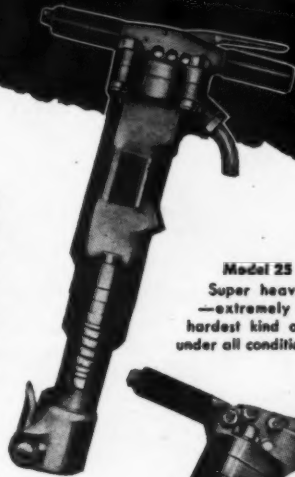
- 1 **Balanced Power**—because only a precisely governed quantity of air is allowed behind the piston.
- 2 **Smooth Performance**—because every stroke is powered by the same measured quantity of air.
- 3 **Air Economy**—because every ounce of air which enters the machine provides a full measure of maximum power for peak efficiency performance.
- 4 **Low Maintenance Cost**—because there are no separate parts of the patented Thor valve to become lost or wear out.

For more detailed information about powerful, easy operating Thor Paving Breakers and complete line of Thor contractor air tools write or wire for catalog 42-A.

How THOR "measured air" economy works—

The shorter the travel, the more positive the action of the valve in admitting to the tool only the required amount of air—in instantly sealing the inlet against excess air.

Short-travel of the Thor Paving Breaker Valve action powers each stroke of the tool with the same quantity of air. Elimination of excess air keeps out of the channel the overload of power that staggers the stroke and causes vibration.



Model 25
Super heavy duty—84 pounds
—extremely powerful—for the
hardest kind of heavy duty work
under all conditions.



Model 23
Medium duty—59 pounds
—exceptional for cutting
walls, floors, and street open-
ings. A hard hitting easy han-
dling machine.



Model 17
Light duty—32 pounds—
easily handled machine for
general light demolition,
breaking concrete floors,
tearing down walls and simi-
lar application.

18 YEARS--NO FAILURES!

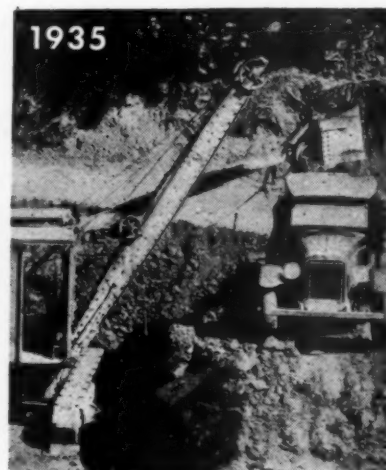
More than 98% of all the General Machines ever built are known to be still in service!*

General Excavators and Supercranes at every corner of the map are proving their indestructible stamina—on thousands of materials handling and digging jobs, military and civilian.

Virtually every General machine since the first built (and incidentally we can send you a very interesting performance history on that one!) is plugging away dependably today.

When Peace returns, bringing its great wave of new construction, Generals' dependability and all-around performance will be ready to help you raise your profit sights.

*Official records are incomplete on the other 2%, since many of them have passed from the hands of their original owners without General's knowledge.



WATCH FOR THE NEW GENERAL TYPE 10 ON RUBBER
The Revolutionary, All-Job "Machine of Tomorrow"

THE
OSGOOD
COMPANY
SHOVELS, DRAGLINES
CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company

GENERAL
EXCAVATOR CO.
MARION, OHIO

CRANES-SHOVELS
MARION
OHIO
U.S.A.
GENERAL
OSGOOD

GENERAL
CRANES, DRAGLINES
AND SHOVELS
DIESEL, GAS, ELECTRIC

PIONEER produces the aggregate for TEXAS' LONGEST ASPHALT JOB!



THERE SHE STANDS, the Pioneer plant that is producing 50 cubic yards of material per hour, passing a $\frac{1}{2}$ " round, for the longest continuous asphalt job ever undertaken in the State of Texas—43 miles. A Pioneer travelling grizzly feeder receives the quarry material and regulates its flow to the crushing set-up. The first crushing unit is a *Pioneer 20x36 anti-friction jaw crusher* mounted on trucks. Crushed material is carried from the jaw crusher by a 30"x70' Pioneer Belt Conveyor to a 4x10 Pioneer triple deck vibrating screen, mounted over a Pioneer steel bin.

The oversize is conveyed to two Pioneer roll crushers, one equipped with corrugated manganese

shells, the other with smooth manganese shells. Crushed material feeds back to the main conveyor thus closing the cycle. The project is typically Texan in size—widening a 20 foot surface to 22 feet and placing a hot mix asphalt concrete leveling and surface course for an average of one inch in thickness over the entire width and for a length of 43 miles. Over 30,000 tons of hot mix asphalt concrete are required.

And required of the aggregate producing plant is continuous, dependable, low-cost production to meet all operating schedules and to make every job show a profit. Pioneer was the choice of the contractor, The Texas Bitulitic Company, Dallas.

Pioneer equipment is profit making equipment. It is durable and built to function with a minimum of maintenance. Planning with Pioneer involves no obligation. Regard its complete service as an ally of your business which is always available.

Pioneer Booklets



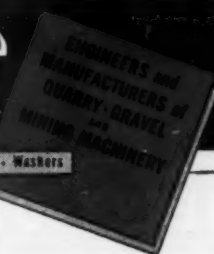
Pioneer Booklets, graphically illustrated, simply detailed, contain money making information for the man getting ready for tomorrow's job. Write for them today.

Pioneer

ENGINEERING WORKS

Jaw Crushers • Roll Crushers • Screens • Conveyors • Feeders • Washers

MINNEAPOLIS 13, MINN



205

NEW KOEHRING
CRUISER CRANE

Does short odd jobs faster. Gets there quicker — at 5.9 M.P.H. Moves loads faster because it can travel, swing, hoist, raise or lower boom... all at the same time. One-man operation, both working and traveling, cuts labor cost. Hydraulic Steering... Stable Chassis... Eight 12:00 x 20 Tires... Visibility Unlimited. Approximately 7-ton capacity.

KOEHRING COMPANY
Milwaukee 10, Wisconsin

ORDERS ACCEPTED
Now
FOR POST-WAR
DELIVERY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

TRAXCAVATE!

It's the MODERN
Earth-Moving and Material-Handling Method

TRAXCAVATORS are the dependable tractor excavators that combine the usefulness of a shovel, loader, scraper, bulldozer, etc. in one machine. Powered by "Caterpillar" track-type tractors, with bucket capacities from $\frac{1}{2}$ to $2\frac{1}{2}$ cubic yards, these multi-purpose machines dig, load, grade, carry and do numerous other jobs quickly, easily and at low cost. Interchangeable attachments increase TRAXCAVATORS' versatility; give them year 'round utility; keep them working more hours on more jobs. "Traxcavate"! That's the efficient way of getting jobs done. Whether you have immediate war-urgent earth-moving and material-handling problems or want to plan for peacetime, write us now for the TRAXCAVATOR story and the name of the nearest Trackson-"Caterpillar" dealer. TRACKSON COMPANY, Milwaukee 1, Wisconsin.

LOADS

GRADES

CARRIES

DIGS

TRAXCAVATOR

The Original Tractor Excavator



**GETTING DOWN
TO WORK
with Plenty of
SPEED--
AND POWER
TO GO DEEP!**

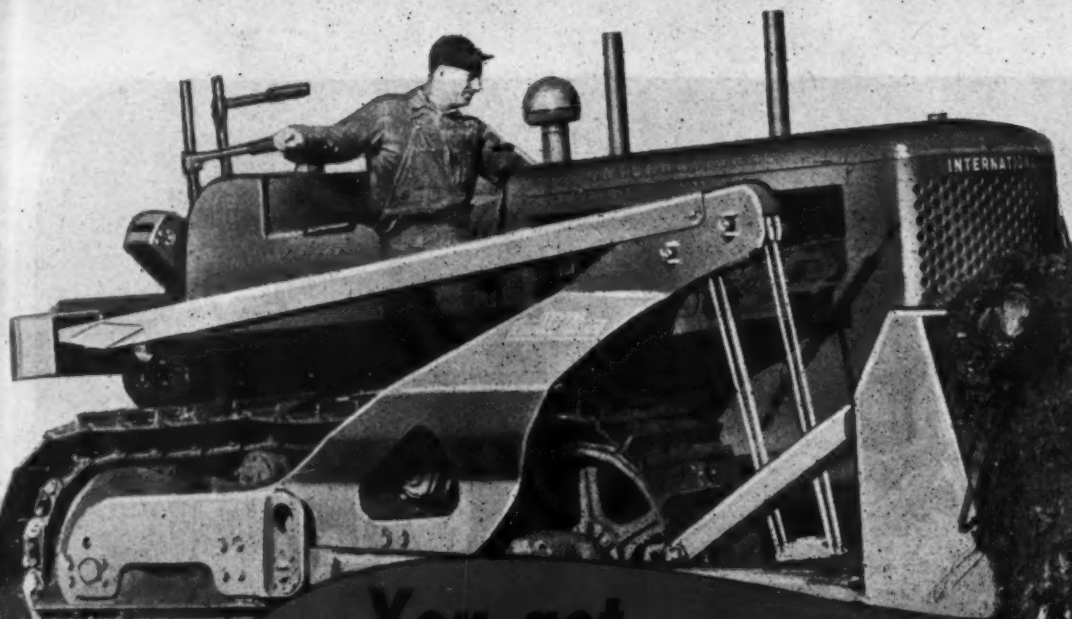
**GET A BIG
BITE
with a LINK-BELT
SPEEDER**

● Seventeen feet below the level, this LINK-BELT SPEEDER equipped with trench hoe, is making time on a precision ditch. Roots, rocks, clay or gravel, they're all the same to this powerful, efficient machine. Weight, balance and finger-tip control enable the operator to do better work, faster, with minimum time or attention for upkeep.

For Prompt, Efficient, Convenient Sales and Service, There is a Link-Belt Speeder Distributor Located Near You.

LINK-BELT SPEEDER





You get
bigger loads and more profits
 with dependable **HEIL**
Cable Dozers



**HEIL Hi-Speed Cable Scoops
 give you extra speed on
 long hauls**

This big 15-yard tractor scoop is push-loaded in 40 to 50 seconds — and hauls at travel speeds up to 20 miles per hour. The tilting floor gives positive mechanical push-out from the bowl and spreads load evenly. It's one of Heil's "bigger yardage at less cost" units that you will need in your post-war business. Write for bulletin today.

**The full power of your tractor drives
 on the blade to move more "pay dirt"**

Here is a rugged unit that is easily adjusted for an extra deep bite — whether in soft dirt or hard-packed clay — to give you a heaping load. And it is just as easy to adjust this unit for side-casting to right or left — to peel a bank — to grade or ditch — or to push straight ahead.

Heil Cable Dozers have the quality features that experienced operators demand: full vision ahead — fast, positive cable control with little effort — smooth action that is easy on the tractor — and less time out for adjustments and repairs. These famous features add up to "big loads" at less cost — and more profits for you.

Write for bulletins

See Your **INTERNATIONAL TRACTOR DISTRIBUTOR**



THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN

PROGRESS

THROUGHOUT THE YEARS!



1884
MARION
 ACHIEVEMENTS
 THROUGH THE
 YEARS WILL
 BRING YOU
 THE SHOVEL
 OF TOMORROW

★ MARION'S contributions to power shovel design and performance have been outstanding for over 60 years.

MARION has anticipated industry's needs by building machines of ever greater speed — capacity — and range.

NOW — TODAY — there is a MARION of the correct size and type to master every material handling problem and digging condition.

What is your problem? Let's discuss it.

THE MARION

STEAM SHOVEL COMPANY • MARION, OHIO

SHOVELS • DRAGLINES • CRANES
 CLAMSHELLS • PULL-SHOVELS • WALKERS

From 3/4 cu. yd. to 35 cu. yds.

Announcement

Cletrac joins OLIVER

The acquisition of "Cletrac" by The OLIVER Corporation proves the importance with which the corporation views the manufacturing and marketing of tractors for industrial and construction needs. To meet the requirements of these users, an Industrial Division of the corporation has been established.

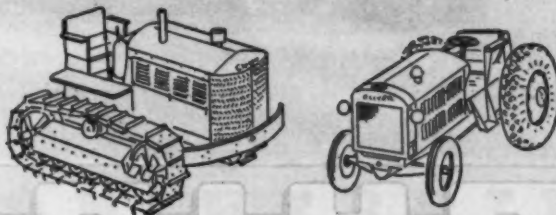
The Industrial Division of The OLIVER Corporation will have its headquarters at 19300 Euclid Avenue, Cleveland 17, Ohio. In addition to the well known "Cletrac" line of track-type tractors and allied equipment, the Industrial Division will also have in its charge, sales and service of industrial tractors of the wheel type now in development as well as other industrial products long manufactured by The OLIVER Corporation.

"Cletrac" Tractors for agricultural service will be handled by the Agricultural Division of The OLIVER Corporation, 400 West Madison Street, Chicago 6, Illinois.

Bringing to "Cletrac's" already ample research, engineering, manufacturing and service the corresponding facilities of The OLIVER Corporation, means that a complete line of even better "Cletracs" will be manufactured in the future and that service to "Cletrac" owners will be enhanced.

The dealers who sell OLIVER "Cletrac" Tractors are now in a position to serve you more completely than ever. The OLIVER Corporation, 400 West Madison Street, Chicago 6, Illinois.

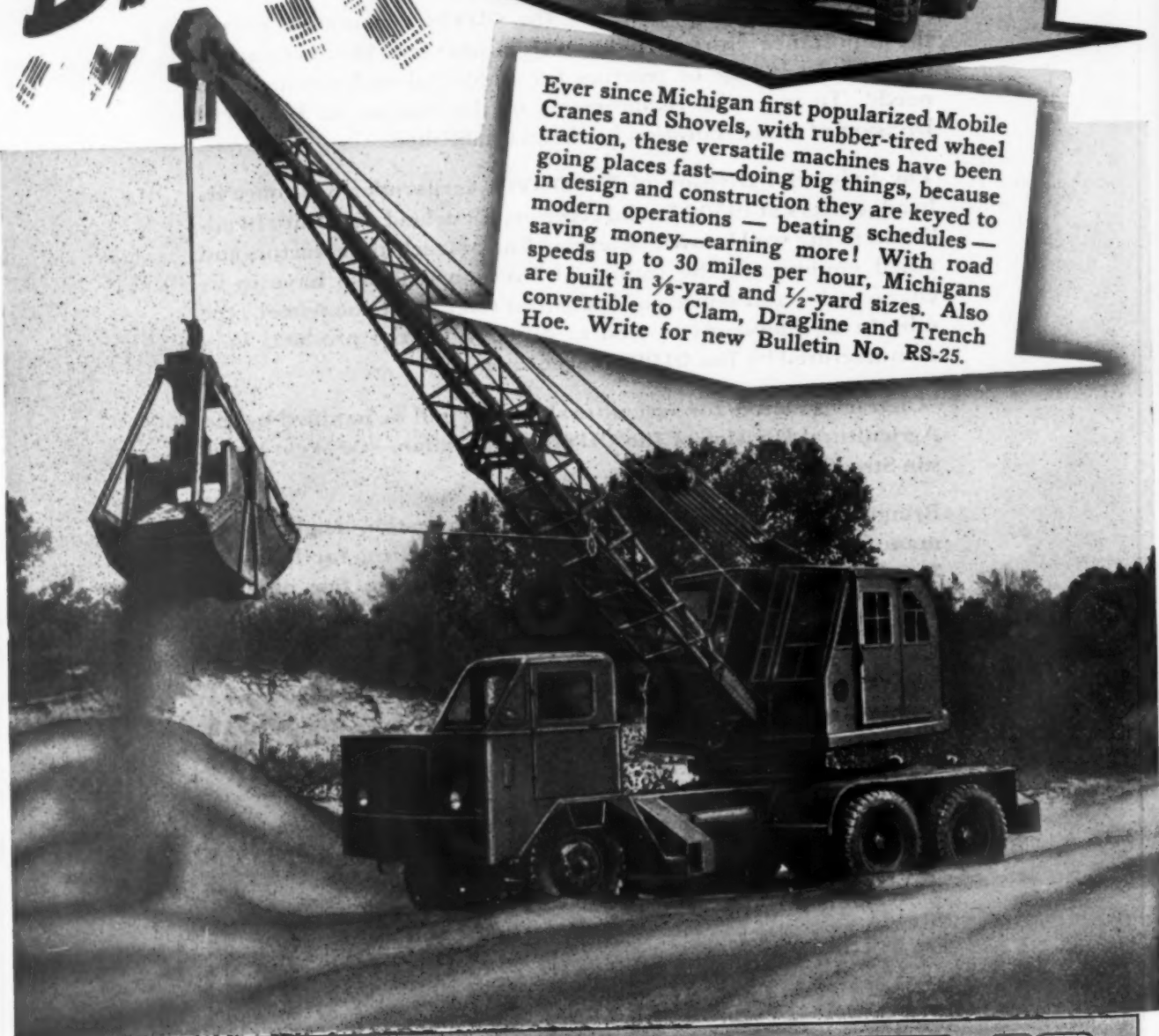
The OLIVER Corporation



Going Places
to do
BIG things



Ever since Michigan first popularized Mobile Cranes and Shovels, with rubber-tired wheel traction, these versatile machines have been going places fast—doing big things, because in design and construction they are keyed to modern operations — beating schedules — saving money—earning more! With road speeds up to 30 miles per hour, Michigans are built in $\frac{3}{8}$ -yard and $\frac{1}{2}$ -yard sizes. Also convertible to Clam, Dragline and Trench Hoe. Write for new Bulletin No. RS-25.



MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN



SERVICE PARTS

FOR MARMON-HERRINGTON BUILT TRUCKS
Shipped by Truck, Train, Ship and Plane...

In almost every country flying a flag of the United Nations, Marmon-Herrington *All-Wheel-Drive* vehicles—military and civilian—are helping win victories for Allied arms.

They must not lose an hour of service for want of replacement parts, if it is at all possible to get the parts to them.

To obtain essential materials, process and fabricate them into service parts, protect these parts from rust and corrosion, pack them safely

for shipment, and speed them on their way, has been a big task in these years of war shortages. But the job *has been, and is being done.*

Every effort has been made to supply essential parts to our customers. It is our obligation, as well as yours, to keep your present Marmon-Herrington trucks rolling until new and improved models are available. In so doing, we speed production of vital war materiel—and hasten the hour of final victory.

BUY MORE IN '45 • WAR SAVINGS BONDS

MARMON-HERRINGTON
All-Wheel-Drive **TRUCKS**

MARMON-HERRINGTON CO., Inc., INDIANAPOLIS 7, INDIANA
 Cable Address: MARTON

Proper maintenance conserves manpower

Maintain your roads to eliminate the necessity of reconstruction. This conserves manpower and equipment.

Surface treatments and other economical maintenance work with Tarmac will help you keep your roads in service and enable them to handle heavy wartime traffic. Where more work is necessary, thicker surfaces can be added economically with Tarmac.

All this work can be done with minimum manpower. We shall be glad to send additional information upon request.



KOPPERS Tarmac

KOPPERS COMPANY INC., TAR AND CHEMICAL DIVISION, PITTSBURGH 19, PA.

Cylinder life multiplied by 5



Cylinder life that is multiplied by 5 is the experience of a large city bus company who made the comparison between PORUS-KROME cylinders and ordinary cylinders in the same engines.

The reason that cylinders last longer when they have been treated with PORUS-KROME, applied by the Van der Horst process, is that it resists wear and corrosion better than any other known cylinder material.

PORUS-KROME is pure, hard chromium which has been processed so that there are myriads of tiny pores and channels in its sur-

face. These pores and channels serve as reservoirs which hold lubricating oil and feed it back to the cylinder surface as needed. Better lubrication, plus the fact that chromium is so much harder than iron or steel, reduces wear to a minimum. Field tests have shown that PORUS-KROME multiplies cylinder life from four to twenty times . . . depending on the size and type of engine.

If you are a builder or a user of engines . . . gasoline or Diesel . . . you will profit by specifying PORUS-KROME. Write for complete information today.

PORUS - KROME

Good for the Life of your Engines



VAN DER HORST CORPORATION OF AMERICA

AN AFFILIATE OF DRESSER INDUSTRIES

**CLEAN • NEW YORK
CLEVELAND 11 • OHIO**

ROADS AND STREETS, February, 1945

*Only an
ADNUN
can lay
BOTH-*



BASE
Any Material
up to 6" depth
and

BLACK TOP
Any Width . . . Any Thickness
Any Mix . . . Hot or Cold

LAYING crushed stone or slag in depths up to six inches, or sheet asphalt only a fraction of an inch thick are everyday jobs for an Adnun. The material can be hot or cold and the width and depth can be controlled to meet any specification.

The combination of Adnun features—Power Cut-Off, Cutter Bar Strike-Off, and Continuous Course Correction produce a final surface smoothness unexcelled by any other method. The power cut-off provides positive control of the flow of materials. The cutter bar strikes off the material to the correct thickness and has an overlapping and crowding action that makes a tight, positive joint with parallel course or curb, greatly reducing hand labor back of the machine.

Continuous course correction automatically corrects hollows and bumps with each successive course. These features particularly fit the Adnun for highway or airport building with the minimum of subgrade preparation and insure a smoother surface even with perfectly finished subgrades. Write today for details or see your Foote distributor.

THE FOOTE CO., INC. 1936 State St. Nunda, N. Y.
THE WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF CONCRETE AND BLACK TOP PAVERS

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER

WITH
CONTINUOUS
COURSE
CORRECTION





Home Base for SUPERFORTS

C-87 Transport Planes Shown in Background
—Press Association Photo

B-29 Superfortresses are hitting Japan hard and often these days, from bases deep in western China and islands of the Pacific.

Here is such a base in actual construction. An International Engine powers the rock crusher, as Chinese peasant workmen bring river-bed stone for the foundation of the field.

Here East meets West. Peasant hand-labor joins forces with a modern International power plant, made at our Milwaukee, Wis., Works. This combination is one of many that is speeding the day of Victory.

International Power is world-wide power. Geographically, International Tractors and En-

gines span the globe. They serve every branch of the Armed Forces—efficiently, dependably.

A big share of Harvester's total production of tractors and engines continues to go to war. Meanwhile, if you own International equipment, you're fortunate. It is quality-built in the first place, plus the added advantage of being backed by a nationwide International Industrial Distributor organization. There's an International Distributor near you who is ready, willing and able to help you keep your equipment on the job.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

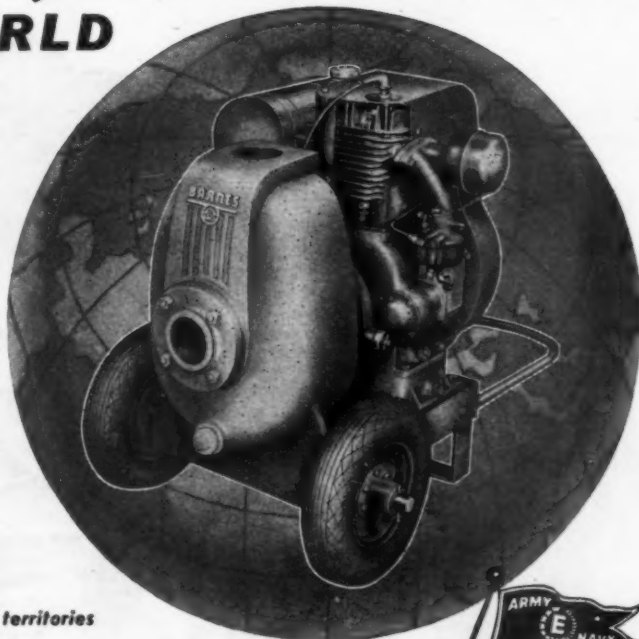


INTERNATIONAL HARVESTER
Power for Victory... Power for Peace

BARNES ... *the Pumps of Super-Achievement* ALL OVER THE WORLD

WHEN the going's tough, when speed is a must ... supplying vital water for men and machines in combat areas ... keeping shelled and mined ships afloat ... setting the pace for fast moving Seabees and Army Engineers on rugged construction projects ... refloating sunken ships in bottled harbors—all gruelling night and day tasks ... Barnes pumps are doing a super-job.

Yes, Barnes new Automatic Centrifugals, the pumps designed with stepped-up capacities, are performing wonders under war's severest conditions all over the world. Their trouble-free service has proved their worth at the front, in the jungles, and on the seas. That's why these new stream-styled Barnes pumps assure you of more gallons of water for your pumping dollar.



ATTENTION DISTRIBUTORS! A number of territories are still available. Write, wire, or phone.



BARNES MANUFACTURING CO.

Quality Pump Manufacturers for Nearly 50 Years

MANSFIELD, OHIO

Multiple Rope



Power Arm



Dragline

DO IT *Better-Faster!* WELLMAN *Williams* BUCKETS

You get better performance ... more dependable performance from Wellman buckets—they're welded rolled steel construction. Sturdier, less breakage.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING CO.

7003 Central Avenue • Cleveland 4, Ohio

Sales and Service Agencies in Principal Cities

ANNOUNCING

GAR WOOD

Cable

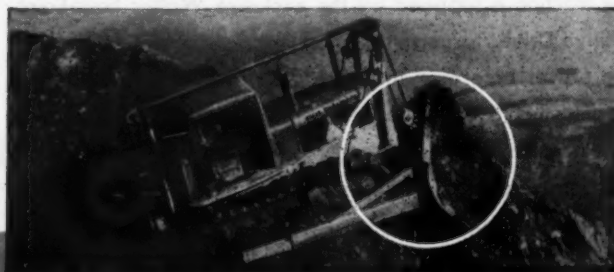
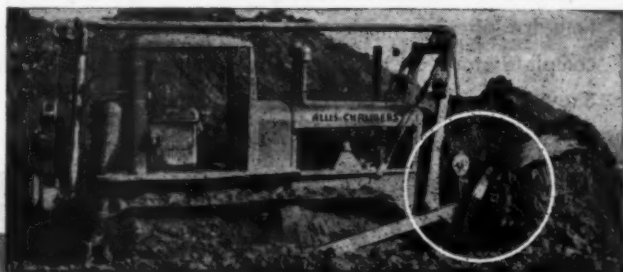
DOZECASTERS



FOR GENERAL EARTHMOVING OPERATION

A newcomer to the civilian field . . . thoroughly tested by months and months of strenuous military service. Designed by Gar Wood engineers and found to meet all Army and Navy requirements, this rugged Dozercaster embodies new and improved engineering developments that give you more efficient performance. Note the moldboard built closer to the radiator for better balance. Easier pushing too, because it

actually rolls the dirt ahead of it. (See picture below) Moldboard can be angled to either side and tilted. Comes with the famous Gar Wood CABLE CONTROL UNIT, either single or double drum. Now available in limited quantities for essential civilian use. Consult your nearest Allis-Chalmers dealer for assistance in obtaining a War Production Board Release.

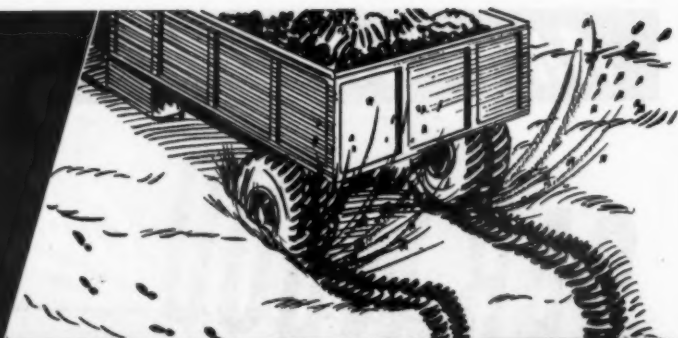


GW ROAD MACHINERY
is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

Other products of Gar Wood Industries include Hoists and Barges • Winches and Cranes • Tanks • Heating Equipment • Motor Boats
ROADS AND STREETS, February, 1945

**NO SLIPS!
NO SPINS!
NO STALLS!**



100% TRACTION MEANS FASTER CLEARING
with WALTER 4-POINT POSITIVE DRIVE!

A truck without traction is helpless on snow, ice and slippery surfaces. Only Walter Snow Fighters have the positive traction which fully delivers tremendous motor power to **FOUR** driving wheels.

This traction is supplied by the exclusive Walter Four-Point Positive Drive. Three automatic locking differentials proportion power according to the traction of each wheel at any instant. Should one, two—even three—wheels momentarily lose traction, the mates carry on—eliminating the wheel-spinning, side-slipping and stalling that slow down or stop conventional trucks.

As a result, no other truck can match the performance of a Walter Snow Fighter. The 250 H.P. model, for example, hits speeds up to 30 m.p.h.—clears a two-lane road in one round trip—blasts through heavy drifts—removes snow before it packs and freezes into dangerous ruts—gains you extra time for opening more miles of secondary roads. For a complete story on the specialized engineering of Walter Snow Fighters, write for detailed literature today.

WALTER MOTOR TRUCK COMPANY

1001-19 IRVING AVE., RIDGEWOOD 27, QUEENS, LONG ISLAND, N. Y.

WALTER
SNOW FIGHTERS

HERE'S THE PIECE WE HOPE WILL
BE BACK IN THIS PICTURE . . . SOON!



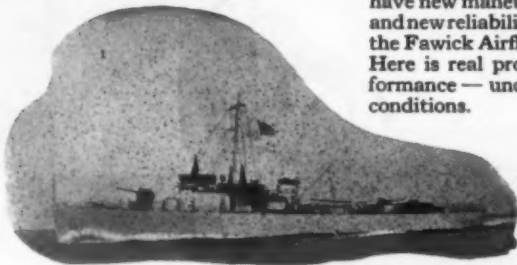
It's the new and improved Huber Roller, whose current performance on wartime assignments foreshadows the role it is destined to play in the nation's road building and maintenance work . . . when the war is won.

THE **HUBER** MFG. COMPANY • MARION, OHIO, U. S. A.

HUBER ROLLERS

We're Looking for

Clutch Trouble



Thousands of naval vessels have new maneuverability and new reliability through the Fawick Airflex Clutch. Here is real proof of performance — under battle conditions.



Now you can equip your heavy duty machines with a clutch that is proof against trouble.

The Fawick Airflex Clutch controls torque by air. Actually, it gives you air-cushioned power. It absorbs shock and vibration, with a clutch grip as firm, or as light, as the job requires.

This revolutionary new clutch needs no arms, levers or springs. It requires no adjustments, no lubrication. It corrects automatically for misalignment. Maintenance costs are unusually low.

The Fawick Airflex Clutch has proved itself in heavy duty service—for Diesel drives, marine and industrial, presses, rubber, paper and steel mills, hoists, draglines, cranes and shovels—wherever the going is tough.

Write us for engineering recommendations based on broad clutch experience.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. • Cleveland 11, Ohio

*In Canada, Renold-Coventry Ltd., Montreal,
Toronto, Vancouver*

In Britain, Crofts Engineers, Ltd., Bradford, England

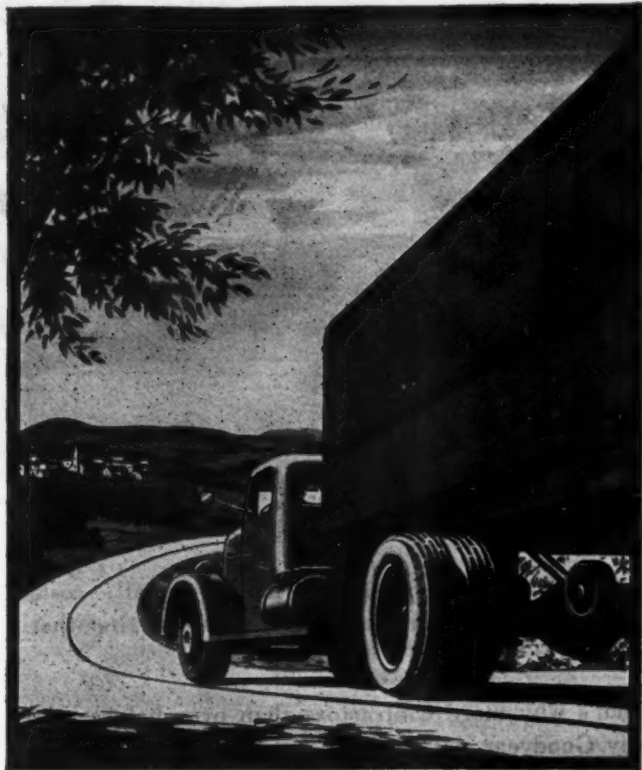
12 Important Advantages

1. Simple in design and operation
2. Flexible control by air
3. No adjustments or oiling—low maintenance
4. Dampens vibration—absorbs shocks
5. Corrects misalignment automatically
6. Smooth starting—no jerks
7. Runs cooler—uniform pressure
8. Controls torque by air pressure
9. Greater capacity—more compact
10. Remote control by air valve
11. Replaces flexible couplings
12. Acts as clutch, slip-clutch, brake and coupling

FAWICK Airflex CLUTCH

POWER CONTROLLED BY AIR

For a Quick Recovery



"Quick Recovery" is the job of the Heavy Wreckers built by Ward LaFrance for the armed forces. When a tank, truck, or half-track is put out of action, these rugged trucks go out and get them. They bring 'em back through sand, muck and rocky terrain, over nearly impossible trails or, often enough, cross country.

Using this equipment, a Rigger-Wrecker graduating class at the O.R.T.C., Aberdeen Proving Ground, hung up an unchallenged speed record by recovering an overturned five-ton truck from a deep ditch in three minutes and 28 seconds, under simulated battle conditions.

If your fleet has suffered from lost tonnage due to wartime lack of trucks, Ward LaFrance trucks are the best prescription for quick postwar recovery. Whether your needs call for dump trucks, over-the-road tractors (gasoline or Diesel), or vehicles engineered to your individual needs, Ward LaFrance offers your best profit opportunity: . . . A plan developed particularly for fleet owners makes it possible for you to take full advantage of the rugged power and dependability of Ward LaFrance trucks on a basis which will cut the cost of transportation to the bone.

WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC.

ELMIRA,



NEW YORK

Any haul rides freer on this EASIER ROLLING TIRE



Allis-Chalmers Diesel Tractor pulling a
Gar Wood Scraper equipped with Goodyear All-Weather Earth-Movers.

IN earth-moving operations—large or small—costs come down when loads move easier on tires that really roll.

That's why more contractors than ever before now buy Goodyear All-Weather Earth-Movers for their drawn units. They know that those wider tread channels and rounded, sturdy diamonds mean protection against snagging—assure freer rolling that keeps the heaviest loads moving on schedule.

THE RIGHT TIRE FOR EVERY JOB Rayotwist-armed for extra strength



**ALL-WEATHER
EARTH-MOVER**
for drawn
vehicles

**HARD ROCK
LUG**
for all rock
work

SURE-GRIP
for drive
wheels

PRODUCTS OF GOODYEAR RESEARCH

GOOD YEAR

THE GREATEST NAME IN RUBBER

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

As rugged as they are sure-footed, these full flotation tires are fortified with a tougher bead construction which provides security against rocking, chafing and rim cutting. And the deep-bite diamond blocks of that time-proved All-Weather tread assure positive traction, prevent side-slip.

Now further armored with Goodyear's patented Rayotwist cord—the strongest body we've ever used in a work tire—these tough giants are by far the best that can be built from synthetic and permissible natural rubber. We believe them to be the longest-lasting, most efficient work tires available today.

Once you get the performance story from the men now using them, you will probably want Goodyears on all your units.

All-Weather, Rayotwist, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company

BUY WAR BONDS • BUY FOR KEEPS

ROADS AND STREETS

February, 1945, Vol. 88, No. 2

110-Ton Bridge Slabs Precast on Shore

Diamond Construction Co. floated 31 deck panels into position, using special gantry crane for loading; over 14,000 lin. ft. of long piling also built at well designed concreting yard

INSTEAD of casting the T-beam deck in place by usual methods, Diamond Construction Co. of Washington, D. C., elected to precast 31 trestle panels on the Route 33 bridge over the Mattaponi River, West Point, Va. Slabs were floated into place. The precasting and setting procedure, combined with the use of long 21-in.-square concrete piles, lends special interest to this \$403,000 contract job which was pushed during the past winter for 1945 summer completion.

The bridge will have a 26-ft. roadway. In addition to 1322 lin. ft. of trestle, in thirty-three 40-ft. panel lengths, there is a 250-ft. through truss swing span with usual pivot and rest piers. Trestle piers consist of 5-pile bents except for the first two piers at either end which are double bents, one row battered. End bents serve in place of abutments.

Casting Yard Laid Out for 3 Jobs

Piling required at this tidewater site ranged from 65 to 82 ft. in length,

Thirty-one concrete T-beam deck panels, weighing 105 to 110 tons each, were precast on the shore, transported by this gantry to a barge, and floated to the site (indicated by cranes in background)

totaling 14,115 lin. ft. for 185 piles. Piling required 1567 cu. yd. of concrete and precast deck slabs about 1850 cu. yd. Casting of both piles and deck panels became a major operation and the contractor gave special attention to the layout of his casting yard. The plan adopted is shown in the accompanying illustration. Under this plan a 27-E paver shuttled between three hoppers as needed in furnishing concrete alternately for slabs, piles, and for the poured concrete in pivot and rest piers and pile caps. The yard was located at the water's edge about 1000 ft. upstream from the bridge and adjacent also to the old bridge.

Concrete for casting in place, totaling about 1500 cu. yd., was loaded into a hoist skip and chuted into 4-yd. hopper bins mounted on small barges. Two barges were used, one having twin hoppers. Concrete was placed by 1-yd. concrete buckets using a floating crane with 100-ft. boom.

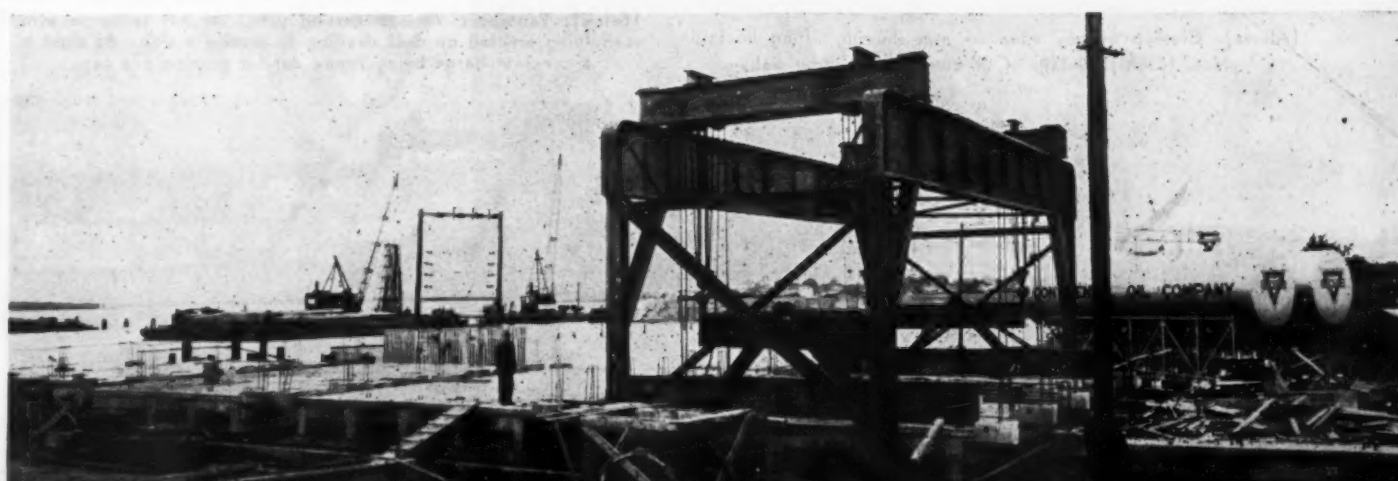
Concrete for casting piles was delivered from the paver via hopper and

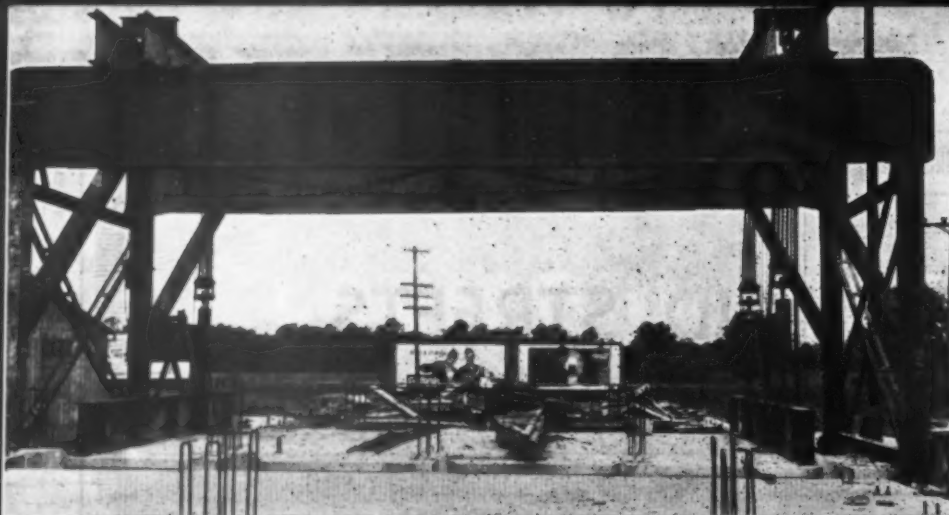
buggies. Piles were built on a casting bed consisting of a 4-in. concrete slab built with heavy mesh reinforcement. V-strips for forming chamfered pile corners were nailed to wood nailing strips imbedded in the floor. Piles were cast in rows of up to 19 piles, the procedure being to cast alternate piles in wood side forms, then replace forms with heavy separation paper and cast alternate piles in the intervening spaces using the first piles as forms. Piles were cured under wet canvas.

Reinforcing cages for piles as well as the piles themselves were handled with a simple 100-ton hand-operated stiff-leg, one rope line hoisting and a rope cradle providing 4-point suspension. Piles were loaded on a scow using a 50-ton floating crane with 105-ft. boom (second of two floating rigs), which crane also set and drove piles.

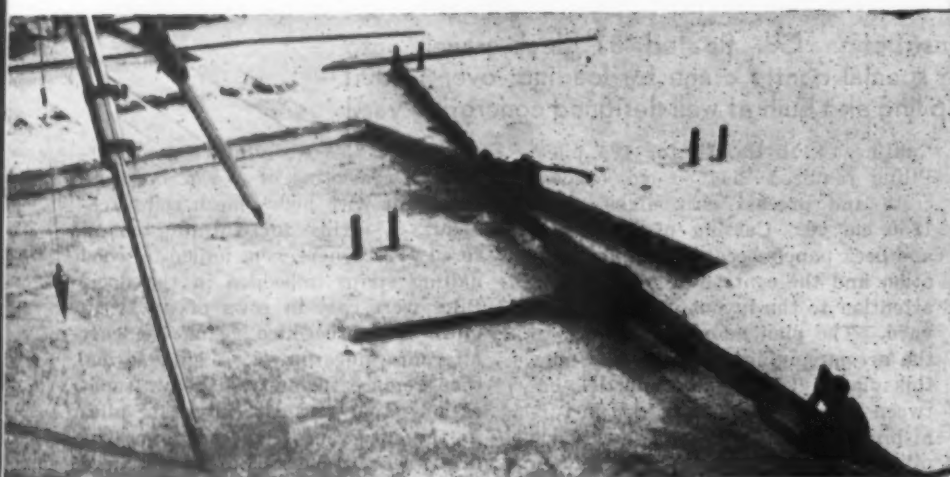
Special Gantry for Slab Yard

The slab yard provided space for casting and curing six slabs at a time.



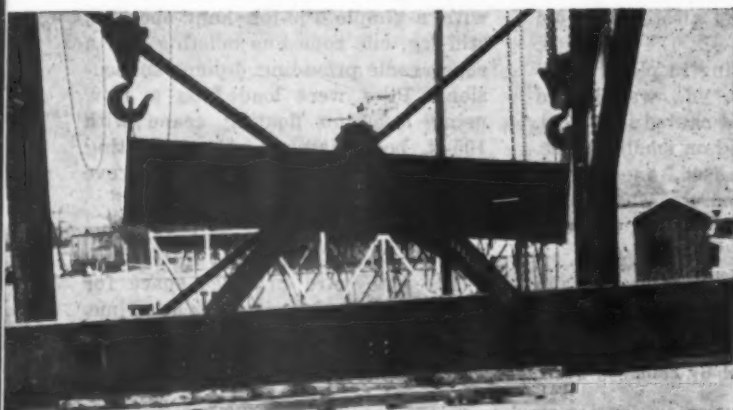


After receiving O.K. on idea of precasting deck slabs, Diamond Construction Co. built a gantry using plate girder spans salvaged from a railroad bridge. Note system of four heavy-duty chain hoists, equalizer arms and lifting girders



Pockets were left in bridge seats, for filling with grout just before final lowering of deck slabs to secure uniform setting of bearing plates

A turnbuckle and chain, anchored to lifting bolts, were used to pull slabs into perfect alignment after setting



(Above): Closeup of one equalizer arm showing lifting hooks in place. (Right): Details of sill construction under slabs



(Below): Panoramic view of casting yard. At left is barge with scaffolding erected on deck, waiting to receive a slab. At right is a concrete barge being towed out for pouring pile caps



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Arranged in a row back from the water's edge, individual slabs were cast with the roadway center line in transverse position. Slabs measured $27\frac{1}{2}$ by 40 ft. out to out. Wooden forms were erected on heavy timber sleepers running under the T-beams and in turn resting on concrete sills. A hopper stationed midpoint along the row was used in casting the slabs.

Slabs ranged from 105 to 110 tons in weight. Lifting and setting onto barges was done uneventfully by means of a specially built gantry. This gantry rode rails which straddled the pile yard and extended into the river on piling to form a barge slip. The gantry bridge consisted of two 50-ft. salvage railroad girders. Heavy H-beam columns and framing carried the load down to 2-wheel rail dollies under each corner.

To insure ample safety and hoisting capacity, lifting was done by four 4-chain hoists, each having a capacity of 25 tons plus 35% overload. Corner lifts were equalized and torsional lifting stresses thus eliminated by means of equalizing arms (see photo). The lift through either arm was transmitted to a heavy H-beam, which in turn was fastened to the slab by means of five pairs of 1-in. lifting bolts.

Lifting bolts protruded from wells filled temporarily with wood, and wells were later grouted after bolts had been burned away.

Chain hoists were hand operated at first, but winch power was provided later to reduce labor and time. The gantry with suspended slab was moved out over the loading barge by means of tractor winch lines running over sheaves at the end of each rail.

How Slabs Were Set

One slab at a time was placed on a scow and carried on heavy scaffolding at about the level required for setting. After the scow was towed into position, water was pumped into it and the slab was thus let down to rest on blocking supported on eight 25-ton ratchet screw jacks. Blocking occupied the vertical height between pier top and underside of slab in the spaces on either side of the outer T-beams. The barge was then withdrawn and the slab let down further to a level about 6 in. above final resting place.

The slabs were given necessary slight adjustments in alignment at this stage by means of a turnbuckle and chain fastened between a lifting bolt of the slab being adjusted and a bolt diagonally opposite on the anchored slab adjoining. Longitudinal adjustment was affected by means of wedges against the adjoining slab.

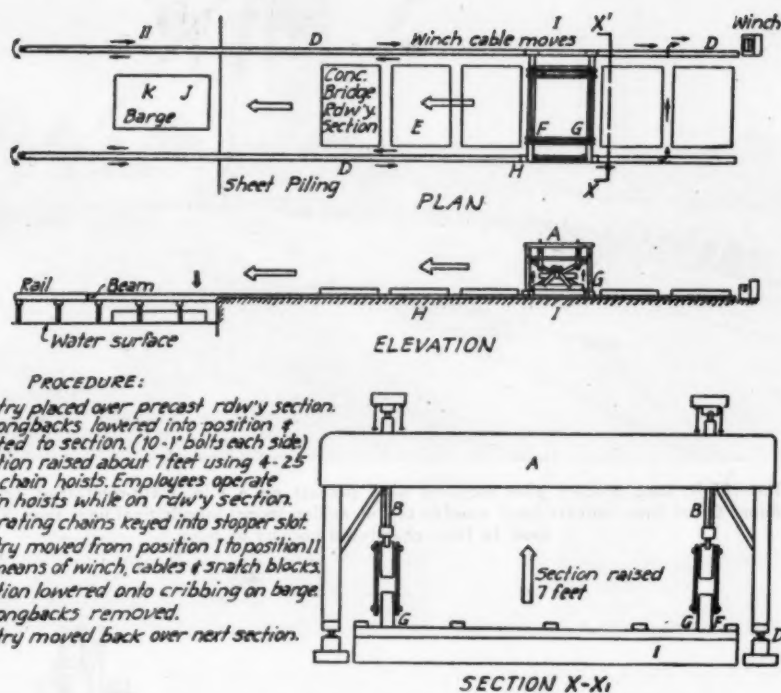


Fig. 1. Layout drawing for casting yard used by Diamond Construction Co. in submitting an accident control analysis to its insurance company

Slab bearings were of two types, as shown in Fig. 1. Fixed end bearings consisted of three layers of steel plates under each beam. One plate was to be inset in the bottom of the slab during the casting, and two plates placed on the pier at the time of setting. In the operation as carried out, threaded bolts were placed through the plate in the bottom of the slab, and the other two plates bolted to these so that all three plates were fixed to the deck slab. Two larger holes were provided through each plate for anchor bolts. Holes for these bolts were cast in both slab and pier cap, calling for very accu-

rate location to insure matching of position.

But to get back to the final setting operation, pockets having about the same dimensions as the bearing plates were built into pier seats at all bearing points. Just prior to final lowering, these pockets were filled with stiff 1-1 cement grout, then slabs were lowered until each plate assembly began to press into and force grout out of the pocket. There the slab stayed until the grout hardened, after which the jacks were removed and the setting job was considered done. The slabs were thus assured as uniform support as though cast in place.

Forms being built and reinforcing set for precasting of slabs





The 185-ft. long precast piles required were precast on a 4-in. mesh-reinforced concrete floor. Cross lines indicate inset wooden sills or nailing strips; longitudinal lines show V-strips used to form chamfered corners of piles



Piles of 65 to 82 ft. length, loaded on a barge by a floating crane

A similar grouting procedure was used at each expansion end, where a special 1½-in. plate with slotted holes was anchored into the bottom of each beam by means of a U-shaped welded strap.

The two end spans were cast in place because shallow water precluded barge setting.

Pile Driving and Pier Construction

Piles were picked up by a sling which again provided 4-point equalized suspension, tipped into driving position; set in the proper channel of a 5-pile lead frame, and allowed to drop with full weight as an aid to accurate positioning. The center pile was driven first, batter piles last. About 15 ft. of driving was usually necessary, using a double-acting hammer of largest obtainable size (14,000 lb. with 5,000-lb. ram). The hammer head was laminated for insertion over protruding reinforcing rods. Pile tops were cushioned with several layers of plywood, also drilled to fit over the rods.

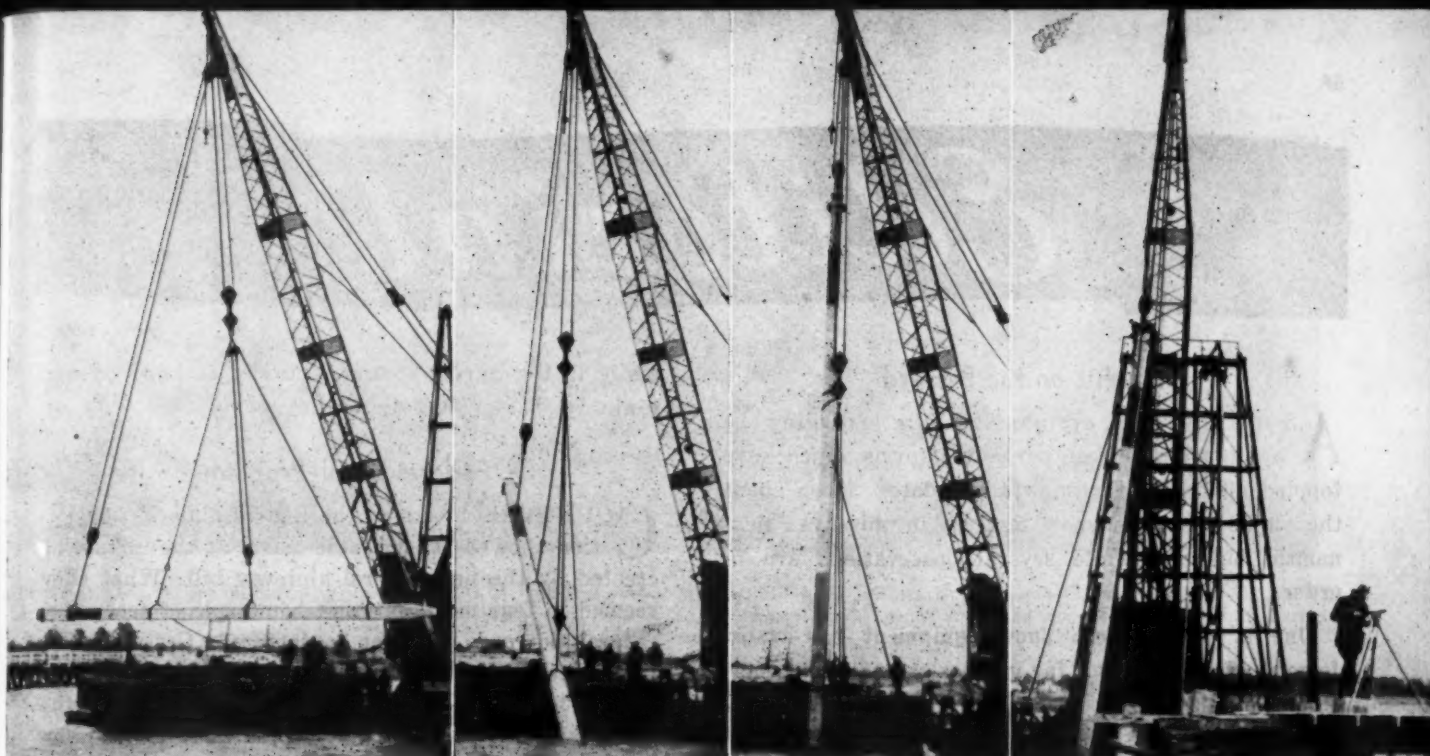
The design load was 30 tons per pile. Considerably higher capacity was obtained, however, using the formula $P = \frac{2H(W' + Ap)}{S + 0.1}$. Where P is

the safe bearing power in lb., W the weight of the ram in lb., A is piston area in sq. in., and P is psi. mean effective steam pressure.

Jetting of piles was very helpful on the west side of the river but less effective on the east due to the presence of an impervious clay. Jetting was done through a 6-in. pump line and 4-in. jet pipe with 1½-in. nozzle. The 220 lb. jet pressure required was provided by two 65-hp. jet pumps

(Left): 27-E paver supplying chute for concrete barge bridge site. This paver shuttled to two other positions to supply precast slab and pile operations. (Right): Several panels in place. End panel in foreground is to be cast in place





Steps in picking up and setting the long concrete pencils. In first scene, note 4-point suspension. Second scene, tipped but still held at four points. Third scene, a new hitch has been taken in order to

raise pile for swinging laterally into position. Fourth scene, pile being set into the batter channel, after which it is allowed to slide with full weight

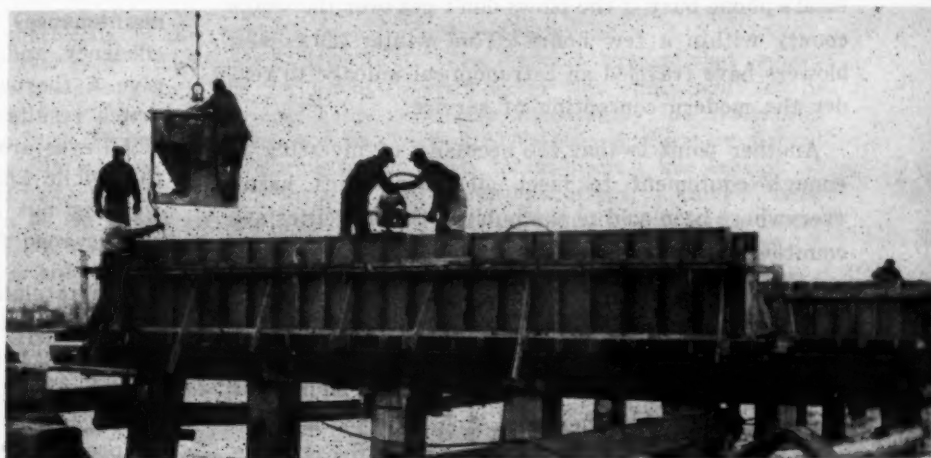
(to 125 lb.) and two 90-hp. boosters.

The three piers for the swing span presented no more than ordinarily difficult problems. Steel sheeting was used. The pivot pier consisted of a circular shaft carried on up. About 13 ft. of concrete seal was required beginning at -33 ft. Foundation piling was cut off at -22.5 ft.

Rest piers were each designed as two circular shafts connected near the top by a concrete wall, which, however, extended below the water line. Procedure for concreting rest piers was as follows: A seal 13 ft. in diameter and 9 ft. 6 in. deep was poured in each cofferdam, foundation piles were then cut off one foot above seal. Then 3 ft. of footing poured on top of seal 13 ft. in diameter, and on top of this footer 2 ft. of foundation 9 ft. 4 in. in diameter poured.

Next pier stems poured up to elevation—1.5. Sheet piling was pulled in each cofferdam opposite each other and redriven to form crosswalls connecting the two cofferdams. Form was then built connecting the two piers and pouring continued up to grade.

The West Point bridge was built with state funds as a strategic structure not, however, on the federal aid system. H. E. Piercy was project engineer. The design was prepared by the Virginia department of highways, C. S. Mullen, chief engineer, and W. R. Glidden, bridge engineer. Burt Crumrine was superintendent for Diamond Construction Co. Steel for swing span was furnished by Carnegie Illinois Steel Co. and fabricated by Virginia Bridge Co. of Roanoke.



Concrete for caps and swing span piers was placed with a 1-yd. bucket. Note two men operating gasoline-powered vibrator

Pan American Engineers to Train in U. S.

Twenty Inter-American highway engineers and construction men are to receive a year's training in the United States with the object of familiarizing them with American equipment, materials, and construction methods. The program is under the sponsorship of the American Road Builders' Association, with the co-operation of the Coordinator of Inter-American Affairs, the Public Roads Administration and the Pan American Highway Federation, operating through the Inter-American Highway Training Committee.

It is planned to make 20 awards for the year 1945, and applications for

these must be submitted by May 1. Each trainee will receive not less than \$125 per month. It is required that applicants must have a good speaking and reading knowledge of the English language, and shall be a citizen of other American republics. Applicants for the Inter-American Highway Training awards must be practicing highway engineers, graduates of engineering schools, with at least 4 years' practical experience, and be between the ages of 24 and 40 years; and practical highway construction men, foremen, superintendents, plant managers, master mechanics, etc., with at least 8 years' practical experience, and be between 28 and 40 years old.

Editorial

Thoughts on the Blizzard

AS this is written, upstate New York is digging out again from a fresh series of storms which have toppled all marks for snowfall to date. More about the valiant work of snow fighters in this area next month, but meanwhile several observations are in order.

One is that modern snow equipment has transformed winter life to a far greater extent than people stop to realize. Only a generation ago, weeks of isolation was taken as a matter of course by most farmers and many entire communities in New York and New England. People got around only by sledges, and lived off of well-stocked larders and bulging graineries and haymows. Nowadays angry citizens keep the road official's phone busy if the plows don't get over the whole county within a few hours. This winter plows and blowers have traveled an astronomical mileage to render the modern conception of service.

Another point is that the necessity of investing in enough equipment to meet all emergencies hasn't everywhere been sold to the public. Several cities and counties and most of the townships in New York State were caught woefully short of equipment. It can't all be blamed on the war. The official or engineer in charge needs to campaign with facts and figures to sell his commissioners on ordering enough equipment, far enough ahead, rather than "too little too late."

The economic loss due to lack of sufficient snow plow equipment is hard to measure, but now while merchants are still aware of the millions in loss of trade and farmers are still digging out, now is the time to get into the newspaper with facts that will win public support to substantial investments in new plows and trucks. This need was particularly acute in cities, where in general the job of digging out took longer. More power snow loading equipment for downtown areas is a prime requisite.

A third point to note is the excellent cooperation of WPB and other federal agencies in this winter's emergency. One New York county reports that red tape was cut and fifteen truck tires secured overnight on a high priority. Experienced plow operators were certified and deferred. New snow equipment was rushed from several factories under top priority. It would be fine to see this type of support extended to other phases of highway maintenance in 1945, especially if the Spring season is to be as hard on our highway system as some predict.

cially if the Spring season is to be as hard on our highway system as some predict.

Federal-Local Problem

COUNTY engineers at the Road Builders' Convention showed considerable alarm at the unknowns created by the new federal highway bill. What they seemed to fear most was that home rule of secondary federal-aid roads has been jeopardized. Certainly few thoughtful engineers want to see local roads administered too much from desks in Washington or the state capitals. Flexibility is needed in setting up design standards and procedures, to permit making best use of local materials and to insure that improvements will take place in the order of the greatest local need.

On the other hand, local road construction (and maintenance) has had a notoriously spotty record of efficiency, and on much of the work no one has had to give a thorough accounting from year to year or match results against any accepted par.

All eyes are on the state highway departments and the Public Roads Administration in their problem of working out a wise administration of federal secondary road funds.

Congratulations (see this issue) to ARBA and AED for staging strong national meetings as a demonstration of big post-war doings to come . . . to Presidents-elect Skelly and Penn, who have a difficult year ahead . . . to Diamond Construction Co. for its bold decision to precast heavy bridge slabs (the railroads do it right along; highway bridge builders, seldom) . . . to Mr. Baldock of Oregon for a maintenance point of view that needs restating.

Coming Next Month: Snow Removal Methods and Problems in the Blizzard Stricken Northeast

Centering in New York State but spread over ten northeastern states, Old Man Winter has put in one of his worst performances in decades. State, county, city, township and airport forces have had a battle, fighting huge drifts, recurrent snowfalls and sub-zero weather with plows, blowers, dozers, motor graders, hauling scrapers, power shovels, loaders and hand shovelers. Watch for your March ROADS AND STREETS, in which Editor Harold J. McKeever and a group of contributors will begin a series of articles on snow removal and winter maintenance in this fourth wartime winter.



In center, Carl W. Brown, outgoing president of ARBA, and President-elect J. J. Skelly. At left are Congressman G. W. Andrews (Ala.) and J. W. Robinson (Utah), House roads committeemen. At right, Rep. Paul Cunningham (Iowa), same committee, and Robt. Brooks of St. Louis, ARBA director

ARBA Meeting Highlights

Over 1,500 attended. Some of the topics; recent road bill; needed new state-county-city relationships; secondary road standards; post-war planning; safety problems; war construction job; airport program and techniques; the construction-equipment picture

WARTIME travel difficulties didn't keep a considerable number of contractors, engineers and official people from getting together at the Stevens Hotel in Chicago last month (Jan. 16-19) for the 42nd Annual Meeting of the American Road Builders' Convention.

Verdict: A swell meeting!

Congratulations, Charlie Upham and all the rest.

A plea to support the war effort in the fullest was voiced by outgoing president Carl W. Brown. In his president's report he traced the recent legislative effort culminating in the new federal highway bill and paid tribute to members for helping maintain a strong association through the war period.

Need for a still larger federal program was outlined by Congressman James W. Mott (Ore.) of the House Roads Committee. While he finally approved the recent bill he said, "I am not particularly enthused . . .

we must consider the [billion a year] program passed inadequate . . . we'll need more money, is the verdict of over 100 witnesses in the road hearings held through last year, and we should go after a real act during the present Congress." An appropriation *three or four times* greater is needed, he feels, and a 3-billion-a-year fund whose *orderly expenditure on roads is required by law* may be necessary to keep road building beyond executive or bureau whim.

Post-war plans preparation? We still are not ready to launch a real road program, warned Maj. Gen. Philip B. Fleming, Federal Works Administrator. In the past year *too little has been done* to translate ideas into working drawings and contract documents. Completed plans for state and federal aid highway work are now sufficient for only about \$400,000,000 worth of construction, [see Jan. R&S for detailed report], less than a half year's work under the

new program.

The present gradual but steady progress in this effort will not be greatly increased by the availability of \$100,000,000 of the new federal funds for immediate use because of personnel shortage, although these funds can supplement funds previously authorized for surveys and detailed plans.

Gen. Fleming told of the price paid in lives and in traffic delays for our obsolete roadways and traditional gridiron patterns of streets and highways. He challenged road builders afresh to take up where preaching of safe driving has failed and stem the 40,000-a-year tide of traffic deaths by *engineering safety into the roads* through more limited access and elevated highways in cities, better intersection design, increased visibility on curves, etc.

Future public construction may possibly be aided, said Gen. Fleming, by Title V of the War Mobilization and



(Left): Jim Wilson, city engineer, Louisville, Ky.; W. A. Rosenfield, dir. of pub. works, Ill., and Thos. H. Cutler, chief engr., Kentucky hy. dept., seated between Mr. and Mrs. James Jacobson, of Ace Joint Co.



(Right): Chas. Smith; Mrs. Paul B. Reinhold, Pittsburgh, Pa.; C. O. Wold, Peoria; Mrs. Chas. Smith; Mrs. Carl Brown, of Missouri; Lt. L. L. Schlesinger; Mrs. J. W. Robinson, Mrs. Marie Maher; Walter Wing; Mrs. Wold



(Left): Mrs. Wesley Polk, Donald White, Mrs. Wm. Kewly, Wesley Polk, chief highway engr., Ill.; Wm. Kewly, Arthur Mamser; Ernest Bederman; Lt. Comdr. Nate Bederman. (Right): Frank S. Gilmore, dist. engr., Asphalt Inst., K. C., Mo.; A. H. Hinkle, dist. engr., Asp.



Inst., Cincinnati; A. Diefendorf, Univ. of Utah; Geo. E. Pearson, vice-pres., E. D. Etnyre & Co., Oregon, Ill.; Herbert Spencer, pres., Asp. Inst., N. Y.; William M. Lees, AGC, N. Y.; S. R. Shepard, dist. mgr., Thew Shovel Co., Albany, N. Y.; Hyland P. George, Delaware Trust Bldg., Wilmington, Del.

Reconversion Act. This title authorizes FWA to loan or advance available funds without interest to states or subdivisions for public construction. Advances to cities could be used for street improvements among other items. Loans are to be repaid when construction begins. The President has requested \$75,900,000 for this assistance, which would be particularly helpful to counties and cities that because of legal limitations or other reasons do not have funds to prepare plans. This fund was not included in a recent appropriations bill, and Gen. Fleming stressed the urgent need for making it available soon.

A 5-billion-a-year total public works program (including highways) is indicated after the war to aid full employment and to provide needed facilities, said the General. A survey shows that local governments have funds available for only about one-third of the projects of all kinds already planned. Serious local public works financing problems are as yet unanswered. First essential: get along with planning. A necessity: state-federal-local cooperation.

How counties and cities will tie into the federal-aid program, and the relationships and procedures that will be set up to administer urban and secondary highway allocations, were on the minds of many. On this subject, House Roads Committee Chairman J. W. Robinson (Utah) said, "Members of ARBA should fully appreciate that Congress and PRA are not seeking to have the state highway departments usurp the road functions of local governments. . . . PRA has tried constantly to strengthen "grass roots" government of roads . . . the new act calls for states to establish a cooperative relationship

. . . if any state through misguided motives sought to take unfair advantage, I am sure the PRA commissioner would follow the spirit of the mandate from Congress to see that local relationships are cooperative rather than coercive. . . . This

new law gives both state and local authorities an opportunity to strengthen and preserve their highway functions.

Eight points to consider by states in preparing a legislative program to meet conditions under the new act, as

THE AIRPORT ENGINEERING AND CONSTRUCTION SESSION

Airport expansion to the tune of perhaps a quarter billion dollars annually after the war will become a brother effort to road building. Their engineering and construction problems have much in common, the same contractors and equipment will serve both highways and airports, and airfield work will continue to draw heavily upon highway experience and personnel. Hence it augurs well that the ARBA has made big strides in bringing the two fields together under its umbrella. A new Airport Division has been formed. And a feature of the Chicago convention, drawing a capacity crowd, was the all-morning session on airport engineering and construction, of which dynamic Jennings Randolph (W. Va.), a member of the House Roads Committee and aviation leader, was chairman.

Speaking on the construction market represented by airports, Lowell Swenson, gen. mgr., National Aeronautics Assn., Washington, visualized the size of the airport building job ahead.

"Airports and Industry," by Leslie L. Schroeder, Comm. of Aeronautics of Minnesota (and read by T. R. Yarrow of CAA Airport Service in his absence), told of the role of the practical engineer and builder, whose eye for utility, function and economy is needed today in producing better planned airports.

The national airport program calling for \$100,000,000 federal aid annually, being considered by Congress, was outlined by Charles B. Donaldson, Director of Airports, CAA, Washington, D. C. He pointed out that for 25 billion dollars in 25 years we built a road system for 32,000,000 motor vehicles. For a much smaller investment we can start this nation on its way to an age of flight. The U. S. will need 6,300 civil airports soon, requiring 3,000 new fields and improvements to 1,600 fields. Construction will be divided 52% clearing, grading, etc., 40% paving, and 8% lighting and miscellaneous.

Latest design, construction and maintenance problems and techniques were highlighted by a panel of editors consisting of Harold J. McKeever, Editor, ROADS AND STREETS; H. W. Hunt, Associate Editor, Engineering News-Record; and Theodore R. Kendall, Editor, Contractors' and Engineers' Monthly. McKeever's paper will be published in an early issue of ROADS AND STREETS.

(Left): O. Turner, A. B. McDonald, L. L. Shidler (and Mrs.) of Ill. Road Bldrs. Assn.; Grace McCulloch; F. J. Kelly, ARBA, Washington; Mr. (and Mrs.) Taylor G. Soper, exec. secy., Ill. Road Bldrs. Association

(Right): A. L. Phillips, H. E. Wolfe Constr. Co., Inc., St.

Augustine, Fla.; T. H. Philan, vice-pres., H. E. Wolfe Constr. Co., Lebanon, Tenn.; J. R. Yarrow, turf engineer, CAA; Frank L. Holloway, airport paving engineer, CAA; John A. Dow, airport paving engineer, CAA; E. R. Galvin, pres., Tyson Bearing Corp., Massillon, Ohio; Hal G. Sours, State Highway Director, Ohio



suggested by AASHO recently, were outlined by Congressman Robinson:

1. Legal authority for state to co-operate with city or county in selecting and improving local projects. Broad powers are needed in negotiating on secondary roads, to permit latitude in fund matching, design standards, construction methods, and maintenance responsibility. States must not be unduly restricted in the law's early application. Projects outside the present state secondary system may need legal sanction to receive funds.

2. Need for broad authority to co-operate on urban construction (participation prohibited in some states); power to designate urban areas.

3. Authority to acquire rights-of-way, by state for itself or in behalf of local government; right of immediate entry.

4. Steps to stop diversion of funds. The diversion penalty of the 1934 Hayden-Cartwright Act, which has stemmed the increase of diversion, will apply on the new program according to an FWA stipulation.

5. Designation of National Highway System routes by joint action with adjoining states; state legislation required in some states.

6. Authority to establish or build limited access highways.

7. Power to enter into agreement with airport authorities for building or relocating roads of access.

8. Legal changes necessary to allow proper contribution by railroads toward rail-highway grade separation projects.

Further thoughts on state-local relationships was the subject of a paper by Hal G. Sours, recently Director of Highways of Ohio, which is reproduced elsewhere in this issue.

County officials in their meeting showed great concern over the eventual attitudes and standards to govern federal aid on secondary roads, to continue on this vital topic. Will PRA demand too high and rigid standards of design? Will low-cost road work become overburdened with on-the-job engineering costs (federal, state and local combined)? Can counties continue to construct by force



ARBA BANQUET SCENES—Road builders seated alternating with war heroes from every front. Center to right: Paul B. Reinhold, banquet toastmaster; Capt. H. W. Johnson (CEC), USN; Carl W. Brown (Mo.); Sgt. Howard Foss; Chas. M. Upham



Wac Lt. Ruth Schiffer; Hon. Paul Cunningham (Ia.), House roads comm.; Sgt. Francis Coleman, Marine Corps.; Hon. J. W. Robinson (Utah), Ch. House rds. comm.; Herman MacDonald, Mass. (pres. AASHO); Sgt. Gilbertson



J. L. Bowen, USN; Congressman James W. Mott (Ore.); J. T. Calloway, Goodyear Tire & Rubber Co., Congressman G. W. Andrews (Ala.), and Jennings Randolph (W. Va.), both of house roads committee; Sgt. K. Dingman, Congressman J. P. Wolcott (Mich.); ARBA pres.-elect. J. J. Skelly; Holger Johnson, pres. Inst. of Life Insurance

account, or must they let contracts? Such were the questions following a summary by outgoing president Otto Hess (Kent County, Mich.) of the ARBA County Section's committee on post-war policies and procedures.

"Come out and get muddy with the boys," is one county engineer's admonition to Washington officials in pleading for assurance of flexible home rule of local roads. Mr. Hess went on to foresee that PRA will develop within itself a group or arm which will know how to get next to the farmer and understand local needs.

ARBA's Pres.-elect Skelly: "I don't believe high type improvements should be built on low type roads."

Otto Hess: "If the states don't call you [county men] together, get together yourselves. Don't wait even a week!"

Resolved, by the County Officials Division (and adopted as a general ARBA resolution): that ARBA directors request immediate consideration of the following procedure:

1. That each state highway department be requested to meet with local governments and decide on plans and steps for distribution of local road work at the earliest possible date.

2. That PRA be requested to prepare, as soon as possible, such rules and regulations for expenditure of federal secondary road funds as will be adaptable to the cooperative state-local arrangements existing in the various states.

Chas. M. Upham urged immediate enlargement and strengthening of the County Officials Division, to which every county should belong either directly or through an affiliated state

Adolph Mueller, commr.; James Duzek, engr.; John P. Ballone, comm'r, Bessemer, Mich.; Julian R. Heelman, Milwaukee; Paul B. Rynning, engr., Medford, Ore.; Wm. Perry, commr, Medford, Ore.; J. C. Akers, county engr., Nashville, Tenn.; Geo. W. Koronski, co.

enr., Bessemer Co., Mich.; E. C. Thacker, USSS, guest, Chicago; C. C. Thacker, Nashville; Bruno B. Ballone, USN, Ironwood, Mich.; Peter P. Parrish, USAAF, Ill.; Margery L. Koronski (daughter of Geo. W.), cadet nurse



association of counties. A committee is to be named to look into the whole question of federal participation.

[Editor's note: PRA is understood to be engaged in the preparation of such regulations, which will have the force of law.]

The construction equipment picture, which concerns us all, was covered by W. A. Roberts, vice pres. of Allis Chalmers. Equipment makers will have a small conversion problem, he said, since most of their war and peace models are similar. He noted with pride the big war job of construction machinery people, who began by rushing trainloads to the Pacific Coast immediately after Pearl Harbor and have produced huge quantities since. On the war surplus question he voiced alarm at a recent San Francisco newspaper ad which announced an auction of several items of heavy equipment and parts, and affirmed bitter opposition to war-surplus sales except through established dealer channels, as likely to injure the buyer as well as the maker.

Mr. Roberts touched on the need for tremendous airport expansion and relocation of airports nearer downtown urban centers. Other Roberts' thoughts:

Soil stabilization will see a big post-war development in the road field.

Construction equipment for post-war must be designed to economize the operator's strength. Speed and load capacity not likely to change much.

War-emergency steel is not up to previous quality and wartime products will not last as long as many users expect.

"Building safety into our highways." Speaking on this subject, Sidney J. Williams, gen. mgr., National Safety Council, Chicago, spoke of the unparalleled opportunity for safety progress which lies in the new road program. Safety must be an uppermost consideration for several reasons. The public expects it and safety will help sell highway programs the public needs. Safety designs are also comfort, convenience and economy designs, in the final analysis.

An intrinsically safe highway comes from finding engineering remedies for (1) Running off curves—the obvious remedy is easier curves and

longer sight distances. (2) Running off either straightaways or curves—wider pavements, shoulders, guard rails. Good shoulders also permit safer roadside stops. (3) Striking pedestrians—keep them off the highway, by providing sidewalks or footpaths, or limiting access. (4) Head-on collisions—separate opposing traffic streams; if the separation is 20 or 30 ft. wide, it also largely eliminates headlight glare. (5) Collisions at intersections—separate the grades, or channelize or otherwise redesign intersections. (6) Collisions with railroad trains—separate the grades.

How one manufacturer helped to advertise the need for a post-war highway program in recent months was told by L. G. Schraub, vice-pres. and gen. sales manager of Union Wire Rope Corp. Believing that it would eventually help business and therefore its sales, this company got behind a promotion effort to sell the ARBA plan to the public.

A fresh picture of Army engineer achievements all over the world and the part of the highway engineer came from Maj. General Eugene Reybold, chief of engineers. The 11-billion-dollar war construction job at home since 1940 includes over 20,000 miles of roads on Army reservations, 5,000 miles of access and 2,000 miles of strategic roads built with PRA direction, 300,000,000 sq. yd. of airport pavement on a thousand fields.

Army construction has fallen to \$40,000,000 per month recently, but some \$250,000,000 additional construction is on the books for 1945, much of which will go for airport enlargement for superbombers.

Engineer troops now number 700,000, mostly overseas. Over 17,000 former state highway department employees are now in uniform.

General Reybold also revealed new data on the size of the U. S. Army construction job in England and France. Taking 19 months to build in order to permit 1,000-bomber raids, American-built airfields in the United Kingdom, have roads, runways and hard-standing areas equal to a 20-ft. road from New York to Moscow.

The new ARBA-sponsored Inter-American training program for highway engineers and construction men in Latin America was discussed by Chas. M. Upham of the Association,

in a morning session given largely to Pan American highway affairs. This program has the combined support of the Public Roads Administration Coordinator, Office of Inter-American Affairs, and the Pan American Highway Federation.

Elliott S. Hanson, president, International Training Administration, Washington, D. C., spoke on the importance of such a program to international trade. Col. M. E. Gilmore of CIAA covered advance training of Latin American highway engineers.

New Officers and Directors, ARBA

President: James J. Skelly, Media, Pa., contractor, who succeeds Carl W. Brown, chief engineer, Missouri. Mr. Skelly for two years headed the Contractors' Division.

Regional Vice Presidents: Paul B. Reinhold, pres., Atlas Equipment Co., Pittsburgh, Pa.; W. A. Young, Cornell-Young Co., Macon, Ga.; E. R. Galvin, pres. Tyson Bearing Co., Massillon, O.; C. H. Purcell, director, California Department of Public Works, Sacramento; H. C. Whitehurst, director of highways, Dist. of Columbia, Washington, D. C.

Directors, elected for three years, were T. H. Cutler, chief engineer, Kentucky Department of Highways, Frankfort, Ky.; E. S. Gillette, Gillette Publishing Co., Chicago, Ill.; O. S. Hess, engineer-manager, Kent County Road Commission, Grand Rapids, Mich.; H. C. Hofheimer, II, Norfolk, Va.; Theodore Reed Kendall, editor, Contractors' and Engineers' Monthly, New York, N. Y.; H. G. Sours, Director Ohio Department of Highways, Columbus, Ohio; Carl O. Wold, Peoria, Ill.

Division Presidents: Arthur F. Ranney, county engineer, Summit County, Akron, Ohio, County Highway Officials' Div.; Nathan L. Smith, chief engineer, Department of Public Works, Baltimore, Municipal Div.; Charles W. Smith, Pensacola, Fla., was elected president, and L. W. Edison, Grand Rapids, Mich., vice president of the Highway Contractors' Div.; Paul Gregg Cochran, president, Buckeye Traction Ditcher Co., Findlay, O., Manufacturers' Div.

Chas. M. Upham
and
General Fleming

(Left): Chas. W. Smith, Pensacola, Fla., new pres., Contractors' Div. (Center): E. R. Galvin, Tyson Bearing Co., new pres. of Manufacturers' Div. (Right): Capt. N. W. Johnson (CEC), U.S.N., who told of the Seabees



State-County-City Relationships in the Post-war Highway Program

Because of the timeliness and importance of his subject, ROADS AND STREETS herewith presents Mr. Sours' paper in detail as a supplement to the Road Builders' Convention report.—Editors.

FOR the first time in the history of federal-aid legislation for highway development, definite recognition has been given to State, Urban and County problems as a joint enterprise. S.2105, recently enacted into public law 521, authorizes the specific earmarking of certain appropriations for the Federal Aid System, for Urban Areas and for Secondary and Feeder Roads.

This is a historic step. Not only can it lead to a program which will more nearly meet highway needs; it can make an even more important contribution, that of research, cooperative study of technical and financial problems, and development of standards and standard practices.

Federal expenditures for highways, carried out through federal aid to the states and through them to the local subdivisions, is one of the sound methods where the federal government may join with the states in creating national wealth. It provides a fine example of the joint expenditure of funds with the balance of control remaining in the hands of the states.

The program which might be developed out of S.2105 and what may follow it has great possibilities, but it must be carefully and soundly organized so that the proper relations between the federal government, the states and their subdivisions may be established. There must be clear-cut rules and regulations adopted, with flexibility so as to be practical and adequate to meet various conditions. These rules and regulations should, insofar as possible, be acceptable to all agencies concerned. And once adopted they should be adhered to. This program, as stated before, is a joint enterprise and its success or failure will depend on whether or not there is developed and carried into effect real and actual cooperation.

Uniformity Among States, Now Among Counties and Cities

The history of the development of the state highway departments and the vast improvements which took place in them after federal-aid for highways became established, is well known to most of us. The Public Roads Administration set certain re-

quirements and standards in design, specifications and in construction practices, which immediately started the state highway departments toward more uniformity. There were many fine state highway departments in the early days but often they operated along much different lines. With the coming of federal-aid to the states, the weaker departments were pulled up to a much higher level and all began to operate in accordance with the same general policies. All this has proved of untold benefit to the highway industry, engineer, manufacturer, producer, contractor, and highway user.

We will now have an opportunity to extend the benefits gained by years of careful study and research, supported with actual development, to the subdivisions of the states. There are many very high-grade city and county engineering departments but undoubtedly there are also some which are sub-standard. Here again, however, there is a need for creating some uniformity in highway policy and practice. The qualified city and county engineering departments can be utilized through proper coordination with State and Federal agencies. Other departments can gradually raise their standards and ultimately meet the requirements.

The use of consulting engineers is especially well adapted to the post-war period. It is always well to have a good engineering department to serve a state or its subdivisions where such a department can be adequately supported financially. It is questionable, however, if such departments should be over-expanded greatly to meet emergency or unusual conditions. The use of consulting engineers offers a solution to such problems well worth considering.

The relationships between the Federal Government and the states through PRA are well established. Let us turn now to the problems which we will need to handle jointly with the cities and counties and discuss some of the things which might be done to jointly solve them.

New Problems: Urban

For the moment, we will consider the Urban problem. For many years, the principal responsibility of the state in providing motor vehicle traffic facilities was thought to be the development of a trunkline system of highways between the corporate limits of population centers, together with the principal trunkline feeder roads. Development of extensions of major arteries into and through municipalities has been generally considered to be the function of cities themselves. Result is that cities now form the major bottlenecks on the nation's highway system.

The problem is not limited to the corporation limits of one city. It extends into surrounding areas and often involves several separate and distinct but contiguous or satellite subdivisions. Each has authority with respect to its own limits but collectively they have no common authority. If the problem of determining the need for facilities in such areas, and location, is left to the separate authorities, there often arises a conflict of local ideas and interests.

A metropolitan authority might be established to meet such conditions. It should, if possible, be clothed with legal power to act. It could, however, range from an advisory board to one with full authority. In any event, such a body or commission, even if created only for the purpose of developing cooperative support would be helpful. It would undoubtedly carry with it considerable weight, behind which public opinion could be brought to bear.

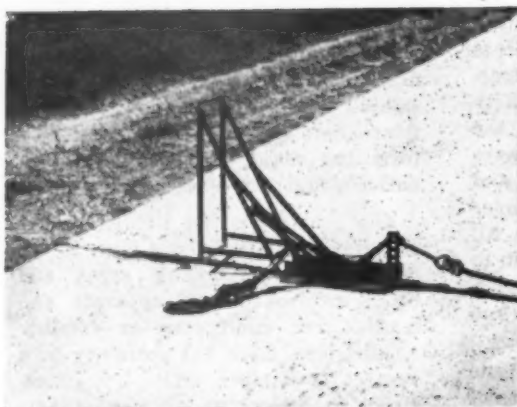
Urban Area Traffic Studies Needed

In the developing of plans for a city or an area, whether the plans are for a complete transportation solution or for certain individual projects of importance, an area traffic and transportation study should be made and the plans then developed as a result of the scientific analysis of the survey. In some cases, a large city may have the required facilities to make such surveys. In other cases, they may employ consulting engineering firms. In still other cases, the city may furnish the greater part of the necessary personnel and the state

(Continued on page 69)

JOB and EQUIPMENT IDEAS

Send in your contributions to this idea exchange and help road building progress. ROADS AND STREETS will pay a minimum of \$5.00 each for any publishable field or office methods or shop kinks. Why not pass this along to your staff and encourage them to send in brief "how we did it" descriptions, rough sketches or snapshots

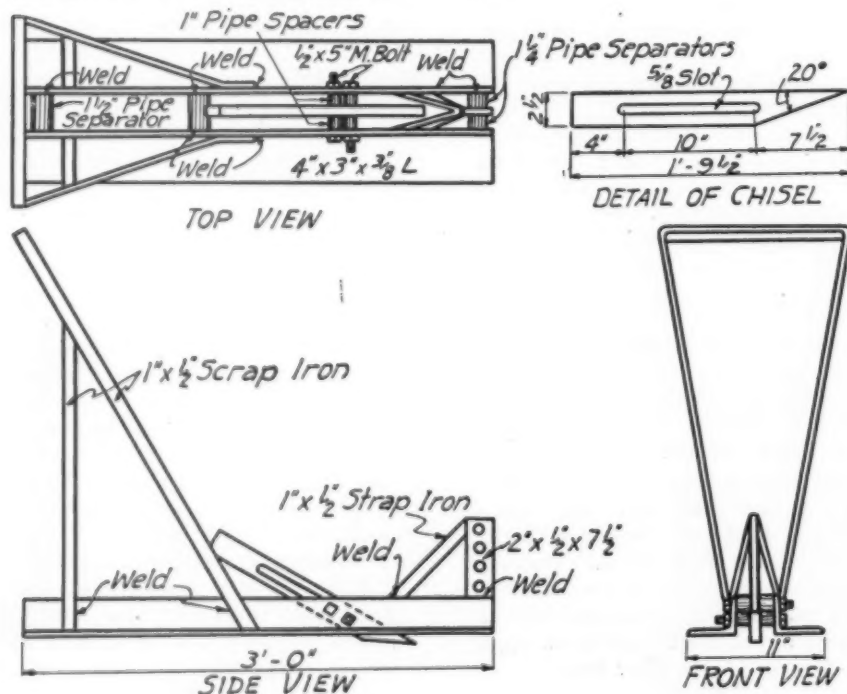


Mich. Highway Dept. Uses Special Tool to Clear Expansion Joints

From B. R. Downey, maintenance engineer of the Michigan State Highway Department, comes the accompanying photos, sketch and description of a specially made expansion joint plow used successfully in clean-

ing out concrete joints. This operation is carried out in connection with resurfacing and also periodically as necessary in regular maintenance.

The plow is drawn by a light tractor as shown. The frame is made of two pieces of light angle iron on which is welded the triangular framing. Note four holes for adjusting drawbar hitch.

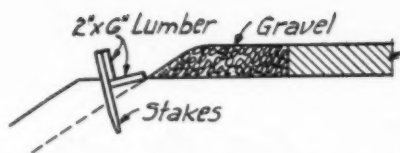


Good judgment must be exercised to select a chisel of the correct thickness to properly clean the existing joint material. Chisel points are made in thicknesses of $\frac{1}{4}$ in., $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in. and $\frac{3}{4}$ in. Points are beveled on an angle of about 20° , have a slot $\frac{5}{8}$ in. x 10 in. to allow for adjustment of the depth of cut, and are mounted at the forward $\frac{1}{4}$ point, the axis of the chisel forming a 30° angle with the horizontal. Two $\frac{1}{2}$ -in. bolts together with 1-in. pipe spacers hold the chisel in proper position.

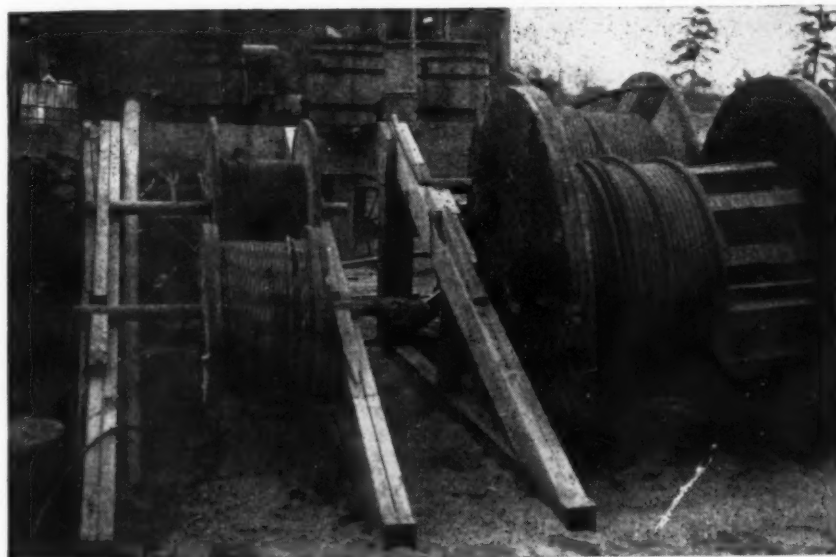
Power to draw the plow may be furnished by a power winch and cable or the plow may be drawn by a moving tractor, using a close hitch.

Temporary Gutter Along Shoulder Protects New Fills

On several access road projects in Oregon last year, your editor saw a useful method of protecting new fills against erosion from pavement surface run-off. The project engineer, on seeing that the soil was particularly vulnerable to erosion, ordered fills topped out two feet wider than called for on the plan. Then he tapered the shoulder gravel off short of the embankment edge (see sketch) and along the edge placed a temporary wood trough, held by ordinary stakes. The troughs, which were sloped to drain to temporary run-downs or nat-



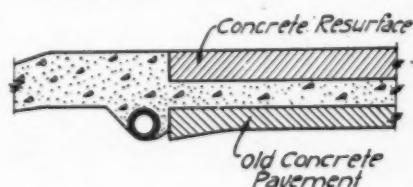
ural outlets, do the job nicely for a year or longer, pending sodding or development of protective grass. A thank-you to L. D. Mars, resident engineer, Oregon state highway department, for this interesting detail. Rectangular troughs set with top flush with the surface of the fill are also sometimes used.



Second-Story Concrete, Half Width at a Time

A section of 4-lane U. S. 99 out of Seattle was resurfaced last year by the Washington state highway department in order to stop pumping of joints under extremely heavy overloads. To correct the superelevation to meet modern standards, the pavement around the curve shown was not given a second story directly on the old slab, as normally would have been the case, but an intervening gravel course was placed (see sketch). Ballast comprising 3-in. max. rock with minus $\frac{3}{8}$ -in. material removed was specified, 50% of the removed fines being put back on top.

A drainage line was installed at the level of the old pavement subgrade. The photo shows one side of the resurface job completed, the new 8-in. by 21 ft. slab being protected by shoulder gravel held in place by a temporary line of 3 x 12 timbering heavily staked.



Heater Located to Do Defrosting Job

Another trick used by the California highway department men in fixing up their snow plow trucks is to put the cab heater unit up by the windshield. The arrow shows a typical example. The heater thus spotted keeps the windshield clear of frost during operations in the deep Sierra drifts, and at the same time has brought no complaints of chilly feet from plow operators.



Home-Made Cinder Grinder and Loader Bin

This labor-saving outfit was built out of bridge I-beams and other salvage material by the Ohio highway department division staff at Middletown. It includes a salvage motor and clutch, which turns home-made rolls that crush cinders to size suitable for de-icing.

Keeping Rope Up Out of the Dirt

Continuing our little campaign to help save perfectly good wire rope from a fate worse than death, your editors herewith publish a snapshot showing the neat rocks used by White Consolidated on their U. S. 66 job near Pontiac, Ill., last autumn. The timber frames are designed so that they can be easily carted from job to job and set up. Reels are let down into position from the truck. Obviously a labor and time saving idea all around. (Note: Tarpaulin to protect the rope from dust and moisture would complete the scene.)



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● When you put Hazard LAY-SET PREFORMED on your machine, you install a wire rope that is ready to start work. You don't have to "baby" it. The preforming process sets each wire and strand at complete ease and relaxes the steel. That's why LAY-SET can work hard from the word GO! More than this, LAY-SET PREFORMED is easier and faster to install and safer to handle.

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RECORDS EFFECT SAVINGS IN TIME, MONEY and ACCIDENTS

W. H. (Bill) Brokaw Tells
How Record-keeping Pays

"Safety is a full-time job," I once read somewhere and I agree. But I'd like to add that no matter how much time a machine operator spends on a safety campaign, he needs a few of the right sort of reminders now and then.

"Not long ago I was on a rush job at an Army air base. We were trying to meet a deadline and didn't wait for wire rope replacements which were on the way. We used about 3,000 feet of wire rope on the job, of the ordinary type and most of it rope which had already been retired. As a result, seven or eight cases of infection developed from snagged hands, and one break resulted in a leg injury. Since most of the men were in the habit of working with preformed rope which didn't snag, they were too late in learning how to handle the old rope to avoid injury.

"An honest estimate of the time lost because of the accidents which could have been avoided by waiting for the new preformed cable would be far greater than the hours of lay-up, had we stopped and waited for deliveries.

Reminder System

"I have a system which will not allow me to forget things like that. I keep a daily diary, in which I record all operation faults. But that's not all. Once a week I go over my record and check such cases and study them. And when I have the chance I discuss with others how they could have been avoided.

"Some operators tell me that they can remember all they want to remember about accidents. But I can't. Unless I study my record and look for better methods whereby I can correct my errors, I find that I soon forget about all but the 'slick' jobs where there were no accidents or faults. The lesson I should have learned is gone, and with it the picture of what happened and what could be done another time to avoid a 'repeat'."

ROADS AND STREETS, February, 1945

Preformed **WIRE ROPE**

SIMPLICITY . . .

The simplicity of the Vickers Hydraulic Power Steering System is evident from the typical application shown below. The System consists primarily of an engine-driven hydraulic pump, a pressure overload safety valve and the booster unit.

The booster is essentially a double acting hydraulic jack with integral control valve which instantaneously responds to the slightest steering wheel movement . . . directing oil under pressure to the booster cylinder and producing linear movement of the attached drag link. The steering effort is not transmitted through the steering gear.

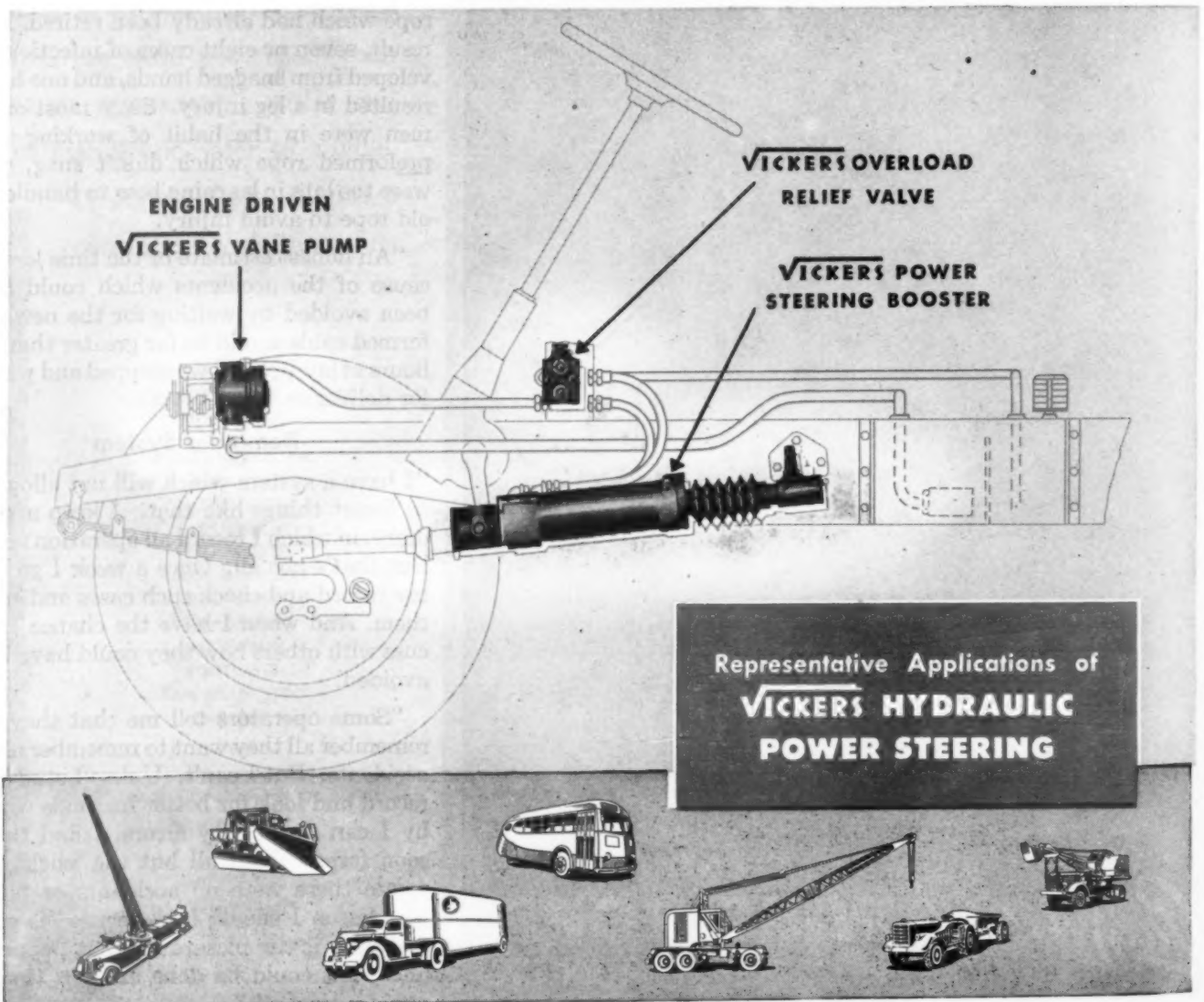
Providing effortless, positive and shockless steering of even the heaviest vehicles, the Vickers Hydraulic Power Steering System has been in use under the most adverse operating conditions for the last 14 years. It assures greater driver

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efficiency by reducing fatigue to a minimum . . . it is easily applied to existing chassis designs . . . it provides automatic overload protection for both steering linkage and hydraulic system . . . it is automatically lubricated. Ask for new Bulletin 44-30 describing all the advantages of Vickers Hydraulic Power Steering.

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State-County-City Relationships

(Continued from page 63)

may set up the project and supervise it. In any event, the state and the Public Roads Administration should assume the leadership in showing the need for such surveys and should be in a position to set up or assist in setting up the necessary machinery and supervision of the work. Here, again, the influence of the federal and state governments can contribute greatly toward uniformity of practices. A complete survey is desirable. All of its elements may not be needed or used to develop the plans immediately needed, but complete information is always of definite and of continuing value to the state and to the city.

It is difficult to set up fixed rules for apportionment of cost of urban projects. The states have different bases for the allocation of gasoline and motor vehicle taxes to state and political subdivisions. Lack of uniformity in this respect makes it difficult to set up apportionment rules which would have uniform application. The financial condition of different municipalities and counties, even in the same state, may complicate the problem. One municipality may have extended itself financially in making certain highway improvements and, as a result, its financial condition is not as good as that of another municipality. Division of the state's share of cost between the state and city undoubtedly cannot follow any fixed rules. However, there should be a sharing on both construction and right-of-way. It is quite likely that conditions will govern and the agreements will be reached through negotiation.

Allocation Between Cities?

The question arises as to the method of allocating the urban funds within a state. Congress properly did not attempt to set up a formula for that purpose. The conditions vary so widely between states that no fixed formula could work successfully. It is doubtful if any set formula should be adopted by the individual states themselves. Federal aid and state matching funds in the past have been allocated within the states by the state highway departments, based on actual needs and with PRA approval. Probably the best interests could be served by the continuation of such policy. Some consideration will undoubtedly be given to the willingness of the cities to participate.

Extreme care will need to be exercised in selecting the classes of im-

provements for the urban program. In new construction in larger areas, the expressway type of highway should be given principal consideration. We need in these areas highways which will collect, carry and distribute large volumes of traffic quickly and safely. There will be other cases, however, where the salvaging of the existing trunkline street facilities may adequately solve the problem.

Summarizing the urban phase, it would seem that the most important step would be, first, to make and develop comprehensive surveys and studies in large urban areas to determine actual needs and, second, to develop plans for projects needed first. In the smaller cities comprehensive studies are often not required; the needs may be obvious. Then, it becomes largely a matter of deciding upon the correct geometric design. In doing this work, there should be a joint program involving federal, state and local engineering facilities, supplemented, where advisable with consulting services.

The next most important step is that of setting up some local agency to act as a clearing authority. Such agency may be official or unofficial, depending on local laws. It is important, in any event, to have some local authority which can pull interested agencies together.

In selecting the most logical projects and allocating funds there must then follow a clear-cut understanding of the control and supervision of the work. This is well and clearly established between PRA and the states and the same can be done with the cities.

New Day for Secondary Roads

The other major item specifically covered in S.2105 is that of principal secondary and feeder roads. The secondary or feeder road may be any such principal road not on the federal-aid system outside municipalities or inside municipalities of less than 5,000 population.

There have been federal aid appropriations for secondary and feeder roads in the past, but unfortunately there has never been full and complete advantage taken of the money appropriated and, as a result, in a number of the states the intent of the appropriation has not been fully realized.

S.2105 specifically requires that roads on which secondary money may be expended shall be selected jointly by the state highway departments and county and local road officials,

with PRA approval. The first big problem will be for the state highway departments and the county and local officials to select a system which will qualify. Care must be exercised so that roads of minor importance are not selected. Spending of money where not thoroughly justified causes public reaction.

Suggested County Procedure

It is suggested that PRA set up qualifying regulations governing selection of the secondary and feeder road system; and that states, in turn, transmit these regulations to counties. The state highway departments could then request a county to report on the state's recommendations. It is believed that with some guidance the submission by the counties would more nearly comply with what would ultimately be approved than if no preliminary instructions qualifying the selection are issued. It will undoubtedly follow that the states will review and make some corrections, possibly deletions and additions.

Extreme care must also be used in selecting and adopting standards of design for secondary roads. It is advisable to set up certain minimum standards covering types, cross-sections, alignment and grade standards, but they must be flexible enough so that unwarranted expenditures are not made simply in order to meet arbitrary standards.

It would probably be well for the state to consider standards suggested by the counties, then select what is thought to be practical, economical and sound. These standards in turn could be submitted to PRA. This procedure would consume some time, but out of it there may come a better understanding of what is needed in the different localities. And it may lead to the adoption and the carrying out of a program which would receive wholehearted support.

Many states will need to pass some enabling legislation to authorize them to negotiate and make some of the necessary agreements between states and the subdivisions. [See *ROADS AND STREETS*, Jan., 1945.] It would be unfortunate to face a willingness to go forward with a program, only to be halted by legal and technical obstacles.

We stand at the crossroads of future highway progress. One road will lead us to real accomplishment through joint effort and cooperation. The other might lead to a divided program of scattered effort and resulting failure. We trust that we will choose the right road.



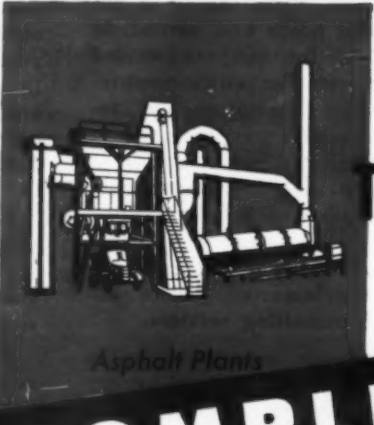
Loaders



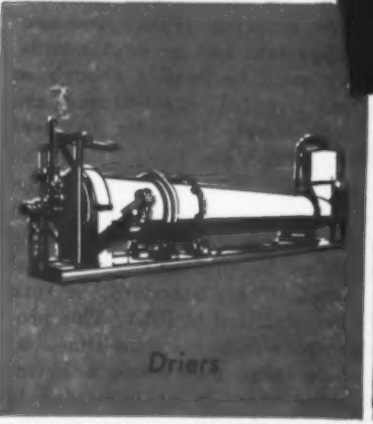
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AED Men Discuss Surplus, Other Problems

WHILE members of the Associated Equipment Distributors are still chiefly concerned with the war effort, they are giving proper thought to the post-war needs of the construction industry. Speakers were about evenly divided on the two subjects at the AED's 26th annual meeting in Chicago, Jan. 22-24.

Over 1300 members and guests registered—indeed a fine turnout.

And the vigor and strength of these leading outfitters of the nation's constructors were attested by the latest AED membership report: 502 distributor members, 186 manufacturer members and 30 associate members, representing a substantial growth in 1944 and a tripling in ranks since 1921. Some 45 lusty local distributor associations are now associated in AED.

As to facilities for supplying and servicing the road, airport and other construction fields after the war, the members never were in better position. Many have expanded their shop space and general facilities. Incidentally, there has been a lively behind-the-scenes shuffle of machinery accounts lately, as manufacturers scramble for the best possible post-war representation.

Expressing the general position of members on war work, president-elect H. O. Penn of H. O. Penn Machinery Co., New York City, observed, "Ever since Pearl Harbor we've been 'up to our necks' working with the Seabees, Army Engineers and other service troops in supplying and keeping going the vast amount of earthmoving and construction machinery needed in modern war. We intend to keep at it, but can now do some planning for the future in order to stay in business, provide jobs for returning ser-

vicemen and help protect the American way of enterprise."

Notes and comments on some of the many speakers during the 3-day session follow:

Latest on Surplus Problem

Government Surplus Disposal Policies were reviewed by Ed. P. Phillips, former AED president and now director, Construction Machinery and Farm Equipment Section, U. S. Treasury Procurement Division, which has been in process of converting from an executive order to the Surplus Property Act.

Mr. Phillips tried with only partial success to dispel postwar business fears by citing the way fearsome surpluses melted after World War I and by pointing to the huge construction volume in sight. "Distributors may indeed feel fortunate that they'll have goods to sell during the conversion period," he stated.

While explaining the impossibility of forecasting postwar surplus quantities he pointed to certain items available now as clues to the future. (A quantity of new 34-E pavers, for example, and some used pavers.)

He advised of the impending release of four to five million dollars' worth of repair parts. The treasury is studying how to get these parts into channels of maximum war usefulness. Many parts are needed for contractors' equipment now down for repairs.

As to recent Treasury Department policies he admitted that errors have inevitably occurred due to the size and unprecedented nature of the disposal task. He said: "A major policy is to sell through regular channels of trade. Up to this time we have not sold direct to consumers, except in cases

where equipment was offered to the distributors first and they failed to bid a reasonable wholesale price or showed no interest whatsoever.

"It has been our thought that any attempt to set the Government up in the retail business on a national scale would be inefficient and uneconomical.

"We believe that consumers can best be served by purchasing from their distributors or dealers who have the facilities to rebuild and service the equipment for consumer use, as most of our inventory is not ready for use without proper repairs and service.

"Our policy is to sell to the manufacturer, dealer or distributor, or combination of levels which will result in: 1. The best interest of our war program; 2. The most equitable distribution geographically and according to need; 3. Speediest distribution to the extent that speed is important; 4. Highest return to the Government considering other pertinent factors; 5. Most satisfactory service to the consuming public.

"As to the method of selling," said Mr. Phillips, "we have in the past employed six: Formal Sealed Bid, Informal Bid, Negotiated, Fixed Price, Auction and Spot Sale.

"I am definitely opposed to two, namely, the negotiated and the informal bid method, and have expressed myself accordingly at Washington and elsewhere."

Mr. Phillips described the "on the spot bid method," tried at several points recently as a possible means of quick, simple disposal of construction of farm equipment through fair and competitive circumstances with minimum speculative and other abuses. Such a sale held at Salina, Kansas, was widely attended, and 245 bidders



BUT, we have young ideas about designing Crushing Plants..

When you buy crushing equipment—or any other kind of equipment, for that matter—the more it weighs, the more metal and labor have gone into it, the more it costs. We have long fostered the idea of cutting down weight and we have succeeded in doing so without reducing capacity or impairing efficiency. Compare modern Universal plants with heavier, bulkier plants and you will find that Universals will give you as much or greater output with even lower maintenance costs. Eliminating this excess baggage has made Universal plants easier on roads and easier to move.

Looking back over the past 39 years you'll find Universal engineers have never been idea-shy. Starting with the overhead eccentric jaw crusher, they have given the industry many developments which have become standard. In the coming postwar period, look to Universal for new developments—continued leadership.

UNIVERSAL ENGINEERING CORP.
631 C Ave. West, Cedar Rapids, Iowa

No. 800 secondary crushing and screening unit steps-up output of a number of types of primary plants.

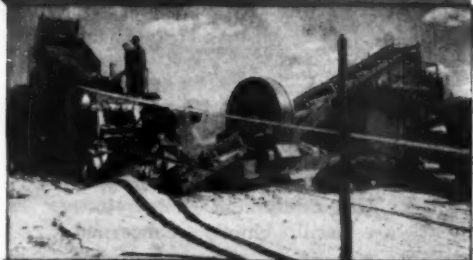


UNIVERSAL

ROADS AND STREETS, February, 1945



Complete, compact "880" primary and secondary crushing plant. At left: Two part portable quarry plant; primary jaw crusher, and secondary crushing roll and screen.



This "822-Q" two-unit quarry plant averages 22,000 yds. monthly. Maintenance costs are low.



This practical gravel washing and sizing plant assures lowest cost per yard of material.

WE CAN CRUSH, GRIND, SIEVE, WASH, AND SCREEN ALL TYPES OF MATERIALS. COMPLETE CRUSHING AND SCREENING PLANTS, PORTABLE PLANTS, ASPHALT PLANTS, GRAVEL PLANTS, ETC.

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from all parts of the country bought 870 pieces for \$330,000.

Mr. Phillips feels that in this disposal job there is no substitute for distribution organizations which have the manpower, management experience, shop rebuilding facilities, finances and sales staff to do the job with least disruption of our economy and greatest help to the war effort.

Government Disposal Methods Criticized

As one of many committee reports, that on the AED's National Affairs Committee, by chairman Wm. A. Danner, told of the U. S. Navy's policy of turning its construction equipment repairs over to a contractor (Dahlstrom Company) rather than to parcel it among established distributors. He mentioned rumors that the Surplus Property Act is to be rewritten but held little revision to be likely.

"We've been spared an avalanche of surplus equipment on the market in 1944," said Mr. Danner. "And distributor business in certain areas was good.... But as a whole the business ethics of the Treasury Procurement people left much to be desired." They returned checks, accepted late bids, negotiated after bids were taken, all for a few cents more, he stated, and threatened at times to throw bids "wide open." He hopes for better relationships in the future, a clearer interpretation of the term, "equipment industry" and elimination of appraisal by people who don't know equipment.

L. W. Gardner of Howard-Cooper Corp., Portland, Ore., sharply questioned many of Treasury Procurement's policies. He questioned the high public cost of holding government "spot sales" such as that at Salina, which was attended by too many government men from various agencies. He also queried that it might be better to junk about 90% of the machinery to be offered as war surplus. "There has been too much money wasted in the sale of old CCC and WPA equipment that should have been junked before the war," he said.

Partly in answer to such a line of discussion, a Treasury Dept. spokesman stated that negotiated equipment deals were on the way out.

One manufacturer spokesman said, "We hear with chills of distributors running to these sales and dissipating their assets by buying up worn-out used equipment. It will hamper them later in buying and selling the new better equipment that road and airport builders will demand." Other distributor commentators in turn characterized this as an extreme viewpoint saying that the law of sup-

ply and demand will take care of a lot of the suppliers' post-war problems.

Better Service Through Advertising: J. A. Maish of the Marion, Ohio, advertising firm bearing his name, outlined the need for the distributor to tell his story through advertising. In addition to publication advertising and use of advertising novelties, Mr. Maish urged greater use of advertising via the mail man.

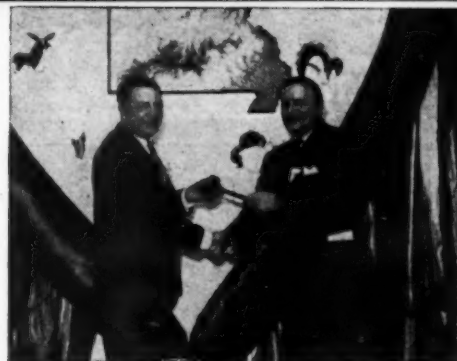
Service Beyond the Contract: E. H. Smith, Smith Tractor and Equipment Co., Irvington, N. J., remarked, "Since the war, service has been more important than ever before. When some repair parts were almost impossible to get, we have all done our best to keep old equipment running. It has been necessary to weld shafts, put new teeth in gears, make our own bushings and other parts. Sometimes we have had to take chances and do things that violated good engineering practice.

Survival Through Service

"Many customers have appreciated this service, while others expected miracles. Many new friends have been made during the emergency, and some have been lost. . . . During the past two or three years, when the demand for construction equipment far exceeded the supply, many newcomers have entered the used equipment field. I doubt if this will be a serious 'problem' after the war. Most of them carry their office in their hats and do not know what a good shop or what good service is. After the war, the legitimate equipment distributor, who maintains a good shop and gives good service, will get the business.

"Now is a good time to take stock and prepare for the post-war period, to make sure that our shops are prepared to handle normal business again. A good service department should not only be well equipped with tools and machinery, but also be well manned. Your service manager, your demonstrators and your partsmen should all be 'sales' minded. . . . They should help keep the good will that your sales force has worked so hard to develop. I have heard of some cases where a grouchy or cranky service or parts man has lost more good will in five minutes than a salesman will develop in a week or a month. The customer's viewpoint should always be considered.

"Guarantee work should be done cheerfully," continued Mr. Smith. "Adjustments on work improperly done should be made promptly and without argument. There are many little favors that they can do for a



Backed by the "Heart of the United States"—Missouri—AED pres. G. W. Van Keppel, of K.C., Mo., turns over the gavel to H. O. Penn, New York, his successor

customer that is appreciated. Occasional mistakes can occur in any shop, but the smart service manager can even use them to build good will, if he will correct or adjust them quickly and keep your customers more than satisfied. It's a good way to build a reputation for honest and reliable service.

Time Payment Machinery Purchases: Saul Gottesman, Pres., Credit Utility Co., Inc., N.Y.C., foresaw that while buying construction equipment "on time" is the exception today, credit buying is likely to be more common after the war. He counseled AED members to consider how this device has speeded acceptance of new ideas, methods, and models in other industries. He suggested that distributors look into the possibility of selling on 25% down payment with a year or so to pay, set up credit facilities, etc., as a means of serving the many small newcomers among post-war contractors.

Construction After X-Day: On this subject Thomas S. Holden, president of F. W. Dodge Corp., saw little reason for anyone to worry about the status of post-war construction planning, which has now rolled up the "makings" of a year's immediate work. Mr. Holden stated that planned projects, public and private, have been accumulating at the rate of \$21,000,000 per business day, which should be a challenge to highway and street officials where recent progress though steady is not up to this figure.

WPB Limitation Orders on Construction Machinery. Ralph Davis of the War Production Board reviewed the various orders including the three revoked in 1944 (L-53a, L-196 and L-217). He credited H. O. Penn as the "daddy" of L-196, now cancelled, which in 25 months resulted in the registering of 330,000 units of construction equipment and the direction of 16,500 units valued at 95 million dollars to essential uses. Important amendments of L-192 dated Jan. 17, 1944, were outlined which removed restrictions on repair parts and shifted certain items from Schedule



THE PROBLEM OF BEARING FAILURE

SUCH THINGS as load, speed and temperature have a very material effect on the life of automotive bearings. Sometimes bearing failures are caused by dirty lubricating oil. When the oil is contaminated with water, fuel, sand, dirt, carbon particles or finely divided metal, excessive wear in the bearings results. Present day driving conditions which tend to create low temperature sludge, clog oil lines and screens and result in burned out bearings.

A great many bearings are ruined by overloading (lugging) and over-speeding the engine; by such driving habits as the prolonged use of the engine as a brake in low gear, down long grades; continuous driving at top speeds; failure to shift gears on hard pulls.

WHY BEARINGS FAIL

1. FATIGUE FAILURE: Due to several causes. Among them: overloading; over-speeding; deflections of crankshaft; insufficient oil clearance or stoppage of oil supply; distortion due to poor fit of bearing inserts; out-of-round crank pins and crankshaft journals. As a result of fatigue failure, the bearing metal cracks and flakes out, the rod portion of the bearing failing first, then the bearing cap.

2. WEAR FROM DIRT: The result of infrequent draining and flushing of the crankcase or infrequent servicing of the air and oil bath cleaners.

3. WIPING: Friction heat often causes the bearing metal to melt and run, or to become soft and plastic. This in turn allows the bearing metal to wipe or smear against the harder metal surfaces of the crank pin or bearing journal, cracking

and wiping the bearing metal. The causes for this failure are: lack of oil; plugged oil passages; clogged pump screen; worn oil pump; leaky oil pump suction line; broken oil lines or connections; misfit bearings.

4. CORROSION: Prolonged high speed driving and overloading will produce crankcase oil and bearing temperatures above 250° F. in most late model engines. At such temperatures most lubricating oils are subject to oxidation and consequent production of organic acids that are corrosive to bearing metals. The remedy is to use lubricating oils that won't readily form corrosive acids and to drain and flush crankcases frequently.

WATCH DRIVING AND SERVICING

To avoid bearing trouble, don't overload; don't brake with the engine for prolonged periods of time; don't use all your horse-

power any more than you have to. Have your engine serviced at more frequent and regular intervals. Use only the best lubricating oil obtainable.

RING-FREE MOTOR OIL HELPS PREVENT BEARING FAILURES

Macmillan Ring-Free Motor Oil has the properties that guard against bearing failure. It has high film strength; high heat resistance; a long cling to the vital parts of your engine; fast penetration. It has a cleansing action that washes away carbon particles, carrying them into the crankcase where these impurities are drained at time of oil change.



FREE FOLDER on "Bearing Failures—Causes and Corrections"—Send today for your copy. Address Macmillan Petroleum Corporation, Room 1008, 530 West Sixth Street, Los Angeles 14, California



**MACMILLAN
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MOTOR OIL**

MACMILLAN RING-FREE MOTOR OIL

MACMILLAN PETROLEUM CORPORATION—50 WEST 50TH STREET, NEW YORK • 624 SOUTH MICHIGAN AVENUE, CHICAGO 5 • 530 WEST SIXTH STREET, LOS ANGELES 14 • COPYRIGHT 1944, MACMILLAN PETROLEUM CORPORATION

ROADS AND STREETS, February, 1945

A to B, though the order still requires a purchase order and rating.

Distributors were urged to avoid overbuying of spare parts, and to continue a vigorous search for good equipment which must be gotten into proper hands as a war aid.

Engine parts and steel forgings and castings are still slow in delivery, though general delays on parts have been cut from a former three months down to two weeks.

Comparison with Good Old Days

A Manufacturer's Experience in Dealing with Distributors: On this topic George Dimond, sales manager, Insley Mfg. Co., speaking with a background of 25 years' experience, told of early innovations such as half and full-length crawlers under excavators and power discharge on pavers, and of the progress in manufacturers' sales policies that has come along with mechanical improvement. "In the old days, the machinery buyer received a lot of attention until the order was placed—then he became the forgotten man," said Mr. Dimond. During the past 25 years distributors have moved from mere downtown sales offices to well-equipped outlying service plants.

Today the well-established distributor with his engineering service on construction plant layouts, his machine tools, overhead cranes, welding and torch equipment, precision motor overhauling tools, etc., and his modern service truck and factory-trained service men, render intelligent and efficient service to equipment owners, said Mr. Dimond. "Competition is no longer just a question of quoting on equipment prices and shadow-boxing on sales points, but of service and operating ideas as well."

Equipment Disposal after the war, said M. B. Garber, Thew Shovel Co., can best be handled under the Milwaukee Plan, proposed originally by F. O. Salditt of Harnischfeger Corp., (government takes ownership but lets mfrs. sell through their channels).

How the U. S. Chamber of Commerce Construction and Development Department committee is set up and what it has accomplished were told by E. P. Palmer, chairman of this committee. This coordinating committee includes representatives of associations of civil engineers and other groups, contractors, equipment and material makers and distributors, etc. As one example, through its recommendations the construction industry was able in 1944 to set up an authoritative Construction Industry Advisory Group, to deal with the industry's over-all conversion problem.

(Continued on page 77)



(Left): W. E. Greene, Vice Pres., Barber-Greene Co.; Lon M. Rish and J. T. Frazier of Rish Equipment Co. (Right): J. Miller; R. S. Risberg (face partly concealed), of Miller, Bradford & Risberg, Eau Claire, Wis.; L. A. Larson, Barber-Greene Area Six Manager; H. D. Bradford, M-B-R Company; Walter B. Holder, Barber-Greene Construction Division Sales Manager, and H. P. Wilson of Wilson Equipment and Supply Co., Cheyenne, Wyo.

Meet "Ham" Penn, New AED Pres.

AED's new president, Hamilton ("Ham") O. Penn, is president of the H. O. Penn Machinery Company in New York City at 140th Street and East River, with branches at Poughkeepsie, N. Y., Mineola, L. I., and Newington, Conn. At these locations, as with other modern distributors, are complete sales and service staffs for rebuilding all types of heavy construction machinery, also parts depots for an enviable line of well known equipment. In short, he typifies Ye Compleat Modern Distributor, who will help postwar roadbuilding swing into high when the day comes.

Mr. Penn was born in Hartland, Wis., in 1896; attended Milwaukee State Normal School; spent several early years as a construction superintendent; then joined the T. L. Smith Company of Milwaukee, where he became assistant general sales manager. In 1923 he decided to open his own business and located in New York City which has been headquarters for his rapidly expanding company.

Today Mr. Penn has also found time to be a director of Bronx County Trust Company, New York, and Tyson Bearing Corp., Massillon, Ohio; trustee of several boys' clubs; active in civic affairs including Red Cross, war drives and so forth. His principal hobby is hard work, summed up by "Let's get the job done." He also enjoys golf, fishing, riding and other outdoor sports.

In the early stages of the war Mr. Penn was called to Washington as a "dollar a year man" and was chief of WPB's Used Construction Machinery and Track Type Tractor Sections, and was responsible for the L-196 Order calling for the inventorying of all used machinery.

In a recent statement concerning the 1945 outlook, Mr. Penn pointed out that the war events "have taken a turn which has caused a tightening rather than a loosening of construc-



NEW PRESIDENT OF AED
H. O. Penn (H. O. Penn Machinery Co., New York)

tion equipment insofar as civilian requirements are concerned."

"Reliable sources," said Mr. Penn, "now tell us that all the equipment which is in Europe will not come back or even be moved to the Japan theater, but will be used for rehabilitation of devastated areas in Europe. This picture is not a bright one but I believe—as most people in the construction industry—that we are rugged individuals and would rather have the plain and unvarnished truth, adjusting ourselves accordingly."

"The manufacturers have been urged by our government to take care of the parts requirements of all machines, because of the lack of availability of new machines for other than the military. One thing is certain—there will be a tremendous backlog of business for all road building people because of the banned construction and pent-up demand, so we can look forward to good business after the war, and for some time to come the demand will exceed the supply."

"In the meantime distributors throughout the country are making every effort to 'carry the ball' for the boys over there, making it possible for the home front to carry on by furnishing proper parts and repair facilities."



More
**COMPRESSED AIR
THIS EASY WAY**

Operating a sand blast on drainage culverts—the job made easier because a steady flow of compressed air is furnished by Schramm air compressors! Just push a button—and all the air you want!

Features: 100% water cooled . . . rugged enough to be towed, even to hard-to-get-to places . . . light-weight enough to be moved about easier.

Schramm is known as a versatile compressor because it can be used wherever air is needed. Necessarily, such a compressor is economical to own. If you are not using a Schramm today, you will profit by writing at once for details and descriptive data.

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(Continued from page 75)

When GI Joe Comes Home. Col. George A. Irvin, speaking on this subject, outlined the Servicemen's Readjustment Act of 1944 (GI Bill of Rights). While the law says Joe can have his old job back, Col. Irvin warned that the returned veteran will not come home the same man. He usually will have developed physically and mentally and become more mature in his thinking. He'll have to face new developments at home.

Canadian AED Growth: Progress among Canadian members was reviewed by Walter J. Kane, Kane Tractor and Equipment Co., Winnipeg; T. F. Just, Just Equipment & Supply Co., Montreal; and James F. Crothers, Geo. W. Crothers, Ltd., Toronto.

Many other excellent papers were given, by speakers which included: Lowell Swenson, Manager, National Aeronautic Assn., Washington, D. C. on the coming national airport program; Major General Eugene Reybold, Chief of Engineers, U. S. Army, and Wm. E. Warne, Asst. Comm., Bureau of Reclamation, on the post-war flood control and reclamation outlook; Hal M. Davis, v.p., R. B. Everett & Co., Houston, Texas, on the distributor's obligation to his customers; Ralph H. Dano, Asst. Dir., WPB Construction Machinery Div., on WPB orders and regulations; E. R. Galvin, pres., Tyson Bearing Corp., luncheon speaker; and numerous other AED members on committee reports on internal topics.

Highway Users Federal Taxes

Federal taxes paid by highway users in 1944 totaled \$627,640,407, according to the National Highway Users Conference. A comparison of the Federal taxes for 1944 and 1943 follows:

	1944	1943
Trucks	\$ 10,120,183	\$ 1,798,380
Automobiles and motorcycles	1,559,800	1,086,456
Parts and accessories	38,775,781	25,063,617
Tires and tubes ..	54,250,349	31,947,997
Lubricating oil ..	66,282,554	49,210,861
Gasoline	328,597,298	265,303,272
Use of motor vehicles	128,054,437	134,619,279
Totals	\$627,640,407	\$509,029,862

38% Increase in Postwar Traffic—According to estimates in the report "Postwar Traffic Levels" published by the Bureau of Transport Economics and Statistics of the ICC, increases in inter-city motor vehicle traffic during the first year after the war will amount to 38 per cent over the 1935-39 average and 6 per cent in excess of such travel in 1941. This estimate is conditioned on the availability of cars, gasoline and rubber.

Charles H. Purcell Receives Bartlett Award

CHARLES H. PURCELL, California director of public works, is the latest to receive the George S. Bartlett Award for distinguished service to the highway industry.

Mr. Purcell's career should inspire many a young fellow. Born in a pioneer Nebraska family and with Irish in his blood he wasted little time in deciding to become a civil engineer. His college days (Stanford, and Nebraska '06) were punctuated by Saturday and vacation work as an engineering draftsman for the Burlington Railroad.

After graduation he served for a period as resident engineer of the Union Pacific Railroad. His various occupations thereafter were: structural design engineer at Ely, Nevada, for the American Smelting & Refining Company, 1907 and 1908; assistant chief engineer of the Cerro de Pasco Company, large South American copper producers of New York and Peru, 1909-1910; designer of structural parts for gold dredgers for Yuba Construction Company, Marysville, California, 1911; chief engineer of the Washington Northern Railroad, Cape Horn, Washington, 1911; bridge engineer of the Oregon state highway department, 1912; and bridge engineer for Multnomah County, Oregon, engaged especially to design and construct the Columbia River highway bridges, 1913.

He later returned to the Oregon state highway department as bridge engineer, where he remained until 1917. In this year Mr. Purcell was appointed bridge engineer for the U. S. Bureau of Roads, and in 1919 was named district engineer for the Bureau at Portland, Oregon. In Feb., 1928, he was appointed state highway engineer of California.

Because of his record and brilliant qualifications, Mr. Purcell was appointed secretary of the Hoover-Young Commission in 1929. The purpose of the Commission was to make a survey and prepare preliminary plans and designs for the proposed San Francisco-Oakland Bay bridge. The Commission adopted the bridge plan prepared under Mr. Purcell's direction and in January 1931, because of engineering qualifications and exceptional organizing ability, he was appointed chief engineer for the newly created San Francisco-Oakland Bay bridge Division of the California Department of Public Works, in addition to his post as state highway engineer, in which position he supervised construction of the world's largest bridge.



Charles H. Purcell

Mr. Purcell was appointed a member of a committee of twelve nationally known highway engineering experts by Secretary of Agriculture Henry Wallace in June, 1937, to promote maximum safety and highway utility; official title—Special Committee for the Consideration of Administrative and Design Policies for Highways.

In Nov., 1937, he was appointed Executive Officer, California Commission for the 1939 Golden Gate International Exposition.

He served as president of the American Association of State Highway Officials in 1938. In May, 1941, President Roosevelt appointed Mr. Purcell a member of the Interregional Highway Committee of seven men to make a study of post-war development of an improved system of National highways.

After fifteen years as State highway engineer, he was appointed in Jan., 1943, as director of the Department of Public Works, in which position he also serves as chairman of the California Highway Commission. In the same year he was appointed chairman of the California State Reconstruction and Reemployment Commission, created by the 1943 Legislature to provide for post-war economy.

Charles H. Purcell is a member of the American Society of Civil Engineers, and of the National Executive Committee of Ten of the AASHO; and is a representative of the United States on the Permanent International Commission of the Permanent International Association of Road Congresses.

He holds honorary degrees of Doctor of Laws from the University of California; and Doctor of Engineering, University of Nebraska.



Cracking, breaking down under pressure
of heavy war trucking . . . neglected unavoidably because of
manpower shortages . . . America's roads are crying for immediate attention.

Meanwhile, the need for completing postwar highway plans to meet the demands
of a new era of transportation is becoming increasingly imperative.

Result: There is a big squeeze coming up. To be ready, maintenance and postwar
planning must both go forward at the same time! It's none too soon to consider your
part in this situation.

That is why we suggest that you call in the Tarvia field man. He can offer you the benefit
of Barrett's 40 years of successful experience in road construction, maintenance
and repair. He can show you how to use Tarvia with local materials, to get the
most miles of smooth, non-skid, long lasting pavement for the money available.

He can help you solve your postwar highway problems—now.

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Stitch in Time Maintenance With Portable Hot-Mix Plants

... and other Oregon highway policies, as discussed informally by state highway engineer R. H. Baldock in interview with Roads and Streets editor

THE Oregon state highway commission is rather unique in its adherence to the premise that when roads are properly located they can be maintained indefinitely. Reconstruction, when it finally comes, in the belief voiced by State Highway Engineer R. H. Baldock, should be for functional rather than structural reasons, i.e., to correct obsolete line, grade, etc.) The type of initial construction is based on a detailed analysis of the amount and character of anticipated traffic, and also on availability of local materials and type of subgrade. The type is chosen which will serve at lowest annual cost including maintenance and amortization. In theory, every highway or street building organization should follow this sound engineering principle. But few do, and Oregon is one that does.

Under this point of view a concrete road isn't expected to last forever as a surface. After a number of years when it becomes worn, it serves as an ideal base for a new wearing surface. Additional layers and patches of bituminous material could be applied for the next hundred years as perpetual maintenance, building up base thickness strength in the process. However, this process would more than likely be terminated by social changes. Coming along every 25 or 30 years, these changes bring new pat-

terns of road needs and are likely to render a road obsolete even if mechanical developments in cars and trucks do not. But the point still holds that a road built initially with a good base can be maintained economically as long as its location will serve.

Oregon is believed to be the first state to design roads for designated speed maximums. At present main highways are designed for 70 mph. and 125 mph. overturning.

"Stitch in Time" Is Maintenance Credo

Coming back to maintenance, this work is carried out in Oregon on the stitch-in-time principle. The state crews today patch promptly and continually with hot asphalt mix, using twelve portable plants, each capable of putting out 100 tons daily. Surfaces are patched to correct roughness as well as to repair breaks. [Editor's note: The state's bituminous roads are among the smoothest riding black top roads in the West.] Smooth riding quality, in fact, is a prime objective, for economy reasons as well as public satisfaction.

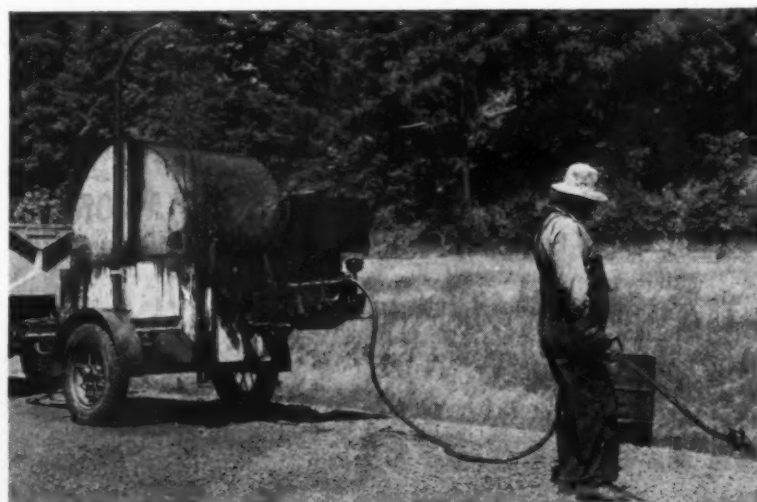
A typical road patching outfit consists of a trailer-type asphalt heating and pressure tank, used for painting ahead of the hot-mix crew; an 8-ton roller; platform trailer or flat-rack truck with ramp for loading and transporting the roller; tool truck;

dump trucks for hot-mix delivery; and necessary rakes. Wheel barrows were eliminated in 1944 work.

Concrete as well as bituminous surfaces are patched with hot-mix materials. In patching an area of concrete pavement, as in general bituminous blanketing, the policy is to place at least 3 in. thickness of mix in order to keep any cracks in the concrete from showing through.

In conducting patching, the first procedure is to take laboratory samples of the stockpiled patching aggregates in order to check quality and determine mix details. Preliminary to placing hot-mix the patch is sprinkled lightly with hot asphalt and the surface heated by the ignition of gasoline, which has been first applied to the area. The mix is then spread and rolled and given 0.15 gal. flush coat and sanded.

Hot-mix plant equipment is largely built to the state's specifications, either in the state highway shop or by Oregon equipment manufacturers. The plants are used mostly for spot patching. They are set in any areas in which enough patching work can be organized to justify the moves, which are usually at intervals of two to four weeks during the season. Material is stockpiled at the chosen site ahead of the plant's arrival, so that the plant can go right into production. Stockpiles run about 10,000 cu. yd. of



(Left): Light, portable outfit for sprinkling patch area with hot cut-back asphalt ahead of the hot-mix crew
(Right): Hot-mix patches in Oregon are rolled with a roller which is transported on a trailer between patching jobs



THIS WINTER, MORE THAN EVER, POSITIVE SKID PROTECTION IS VITAL

ROLLING WHEELS speed workers and raw materials to factories, finished parts to assembly points and implements of war to the armed forces. They must not skid on icy turns nor stall on slippery hills.

Give 'em traction, keep 'em rolling all winter by effective ice control, with abrasives that dig in and hold. Sand or cinders treated with calcium chloride dig into the ice — fast. Such treated abrasives do not freeze in stock piles, are ready for instant spreading. They go three times as far — stay

on the ice many times longer — combine highest efficiency with greatest economy.

Calcium chloride, the active agent which gives abrasives their ability to bite and hold steady, also gives them their fast action even at coldest temperatures.

Write today for Bulletin No. 27, "Skid-proofing Icy Roads and Streets." 36 pages give you data on ice control methods, materials and equipment. Get your copy now.

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ICE CONTROL WITH

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Icy Roads
to Tires

stone or sand required for oiling, patching and general maintenance, material being generally supplied commercially at about \$3.00 per cu. yd. currently (\$1.50 before the war). Plant locations in 1944 were selected with the policy of keeping truck hauls under 25 miles, to save wear on tires and trucks.

The labor situation, of course, slowed down 1944 patching work. But the state's foresight in building four 100,000-gal. and four 50,000-gal. asphalt storage sumps made it possible to keep asphalt on hand in spite of the tank car shortage which prevailed for a time. And this insures steady work for the repair crews. A successful attempt was made last winter to find temporary employment in outside industries for crew personnel during the slack months, in order to keep good crew personnel available.

When Roads Finally Wear Out

When a road finally must be rebuilt, Mr. Baldock's ideas on how to proceed are equally clear and refreshing. Sometimes an old road can be reconstructed to modern width and road-bed strength with little line change. But more often in Oregon the best solution from every standpoint is a complete relocation, for other reasons than to improve alignment. Relocation to a brand new line frequently makes it possible to get right-of-way at less cost. There's also less trouble in getting limited access provisions in the deeds.

And relocation avoids much of the expense and delay to state and public alike. That is inevitable when an existing road is rebuilt under traffic. Even when the old road has good alignment, considerable grade change may be necessary to improve the grade line, or vice versa, and hence there is a disappointing amount of salvage in most reconstruction anyway.

Perpetual Inventory of Road "Book Values"

Construction, maintenance and reconstruction finally merge into a total or cumulative cost of road service. Another element of Oregon state road management seldom seen in actual practice is a perpetual inventory system of highway valuation. Every section of every state highway is down on the books with a "value" which represents its total or cumulative cost to date minus depreciation. This value is correlated with the physical condition of the road and also with its revenue earning ability or the value of the gasoline taxes and license fees contributed by its traffic.

This business-like procedure enables



Prompt and skillful patching is the key to Oregon's program, for which one of the main objects is to maintain smooth riding conditions

the highway department to keep the system solvent as a whole, and to know at all times whether any certain road is solvent or has cost more to build and maintain than it is worth.

Facts of a bookkeeping nature such as these are of great value in planning and determining which projects

are most in the public interest. They also help back up the department in selling any sound program or project to the public. Mr. Baldock's policy has been to initiate no program or improvement until Oregon citizens can be sold on engineering that is economically justified.

Post-War Notes

Montana contemplates a road and bridge program of \$45,000,000 during the first few postwar years, writes H. W. Holmes, state highway engineer. Forty million dollars should be accomplished under the F. A. act of 1944; the balance to be financed with unobligated prewar balances. Montana anticipates an operating fund of \$14,630,000 during the first three postwar years.

Deducting estimated expenditures for administration, debt-service, surveys and plans, right-of-way, maintenance and equipment amounting to \$11,290,000, leaves available for construction \$3,340,000. Augmenting this by a carry-over balance of \$1,200,000 remaining after matching unobligated balances of federal funds, there will be available from current revenue during that period, \$4,540,000 state matching funds.

Assuming that 10% of the new federal funds will be expended for grade elimination projects, there remains a balance of \$21,508,000 to be matched on the basis of 43% of the cost of construction. Thus local funds will be called for in the sum of \$16,200,000. Additional financing of \$11,660,000 will be needed if the potential federal-aid program be accomplished during the first three postwar years.

Use of the old abandoned Illinois and Michigan Canal bed as the site

for a super-highway leading from Summit into Chicago from the southwest was proposed recently, and a special state legislative commission voted to study the matter. The canal has a bed width of 60 ft. and a 90-ft. adjacent spoil bank width is also to be sought for right of way.

Perry T. Ford Appointed Ohio Highway Director

Perry T. Ford, widely known Columbus civil engineer, has been appointed Director of the Ohio Department of Highways, by Governor Frank J. Lausche. Mr. Ford served as President of both the Ohio and National Societies of Professional Engineers.

The work of the Highway Department will not be new to Mr. Ford, since he served as Columbus Divisional Engineer in the State Highway Department during the administration of Governor James Cox. He was County Engineer in Putnam County at one time also.

British Road Mileage.—The United Kingdom has 181,400 miles of roads, classified as follows: 4,456 miles of trunk roads improved and maintained out of national funds under the Minister of Transport; 41,000 miles of "classified roads" improved and maintained in part by grants out of national funds and 135,000 miles of "unclassified" roads improvement and maintenance of which is a local charge.

Cost Analysis of Highway Contract Construction Projects

How Oregon keeps tab on construction costs, along with actual breakdowns for a recent typical job

THE need for more cost information on highway construction work essential for making accurate estimates on future projects, the adjustment of claims, and the preparation of price agreements and force-account orders, became apparent to Mr. Baldock, State Highway Engineer of Oregon when he took office in 1932. In the years that followed, using a cost accountant with considerable knowledge of construction work, the Oregon State Highway Commission has been developing some interesting and useful information on the relationship between contract bid prices and contract costs, price trends, and tables useful for estimating purposes.

The cost analyst, E. H. Clymer, has also created a relationship between the contractor, superintendent, foreman, bookkeeper, engineer and inspector that brings close cooperation in the cost keeping work. Direct access is had to the contractor's books and the information is kept confidential. This cooperation is very essential if constructive facts and figures are to be obtained. Most contractors keep cost records and usually have a daily report, a weekly report or a monthly report. These reports along with contractors' ledgers, payrolls,

equipment time records and itemized bills usually give quite a complete break-down of costs on the many operations performed on each contract. The records and reports made by the engineer and inspectors, and information obtained by personal contact, observation and time studies are also necessary in preparing a cost report of a project.

During the past twelve years cost records have been made on 410 con-

tracts representing an expenditure of about \$28,000,000. Also during this period cost records were made on about 40 WPA projects on state highways representing an expenditure of about \$10,000,000. Cost records are not kept on all contracts but are kept on a sufficient number of the various types of construction throughout the state to reflect the actual cost of the various components of highway construction.

Table 1

Equipment Time and Rental Allowed on Contractors Equipment for the Project

	Operating Time		
1 1/4-Cu. yd. gas shovel.....	4 mo. at	\$ 450	\$ 1,800
1 1/2-Cu. yd. gas shovel.....	5 mo. at	350	1,750
15 Dump trucks	74 mo. at	200	14,800
1 Tractor (61-h.p.)	5 mo. at	350	1,750
4 Tractors (96-h.p.)	17 mo. at	450	7,600
4 Scrapers (15-cu. yd.).....	15 mo. at	350	5,250
1 Bulldozer	5 mo. at	120	600
1 Clearing machine	1 mo. at	100	100
2 Motor graders	8 mo. at	375	3,000
1 10-ton 3-leg roller.....	4 mo. at	300	1,200
1 Water truck (1,000-gal.).....	2 mo. at	200	400
1 Small crushing plant complete.....	2 mo. at	1,200	2,400
4 1,500-W. light plants.....	21 mo. at	40	840
3 Pick-up trucks.....	22 mo. at	50	1,100
2 Steam boilers	4 mo. at	100	400
1 Retort	2 mo. at	175	350
1 Distributor (1,000-gal.).....	2 mo. at	375	750
1 Asphalt storage tank (6,000-gal.).....	2 mo. at	100	200
2 Asphalt Transports (1,500-gal.).....	4 mo. at	200	800
1 Power broom	2 mo. at	140	280
1 Electric welder (200-amp.).....	6 mo. at	75	450

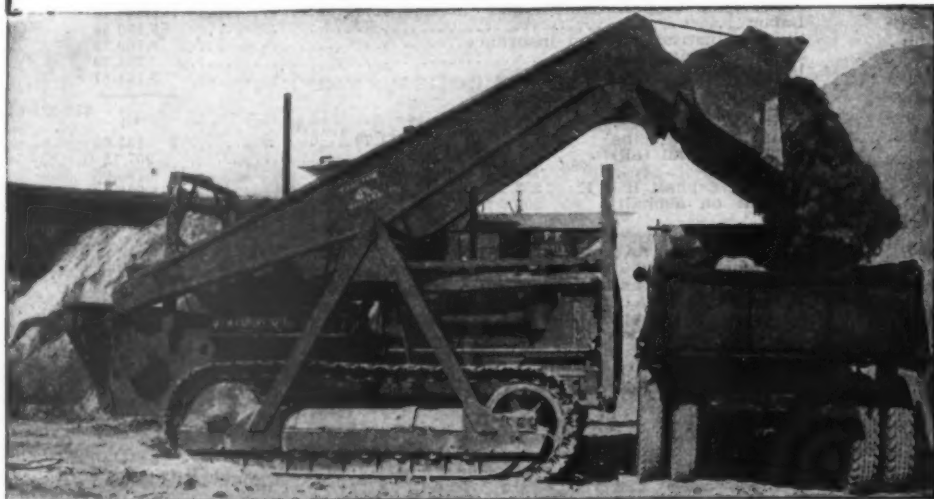
Equipment rental rates includes major repairs, depreciation, taxes and interest on investment.

Table 3. Ledger Setup Showing the Distribution of

	Total	"P" Supervision and general expense	"P" Mechanics grease monkey service truck & repair shop	Clearing and grubbing	Common excavation	Finish roadbed & slopes
Pay Roll						
Supervision (superintendent and timekeeper).....	\$ 6,348.73	\$ 6,348.73				
Labor	65,130.36		\$10,873.55	\$ 509.80	\$15,342.84	\$1,115.60
State industrial accident insurance.....	3,700.29	133.32	489.35	30.59	920.64	66.94
Social security	714.79	63.49	108.74	5.10	153.44	11.16
Unemployment insurance	2,144.37	190.46	326.21	15.29	460.33	33.47
Materials						
18-in concrete pipe.....	132.60					
Fence material	907.12					
Asphalt	3,785.05					
Cutback asphalt	2,200.38					
Freight on asphalt.....	6,564.92					
Equipment Rental and Supplies						
Equipment rental	45,820.00	550.00	1,215.00	480.00	17,715.00	930.00
Gas, oil, grease and fuel oil.....	16,959.75	474.50	534.20	115.20	4,514.15	246.20
Lumber	1,695.50		185.00			
Miscellaneous supplies and tools.....	8,468.40	745.10	1,122.50	42.50	2,040.90	116.40
Freight and cartage.....	5,565.71			64.00	2,431.50	
Bond and liability insurance.....	2,069.75			66.00	706.32	20.00
Home office and overhead.....	6,365.00	6,365.00				
Mess house and camp supplies.....	7,059.36					
Subtotal		\$14,870.60	\$14,854.55	\$1,328.48	\$44,286.12	\$2,539.77
Prorate supervision and overhead.....		(\$14,870.60)		139.78	4,606.00	306.72
Prorate mechanics and service truck.....			(\$14,854.55)	161.91	5,987.81	300.12
Total	\$185,623.08	0	0	\$1,630.17	\$54,879.93	\$3,146.61

"P" = Proratable items.

McCAFFREY TRACTOR SHOVEL



1¼-yard capacity bucket.

- 100% cable control of bucket.
- Weight centered on truck frame.
- Design permits bucket to reach over center of the truck.

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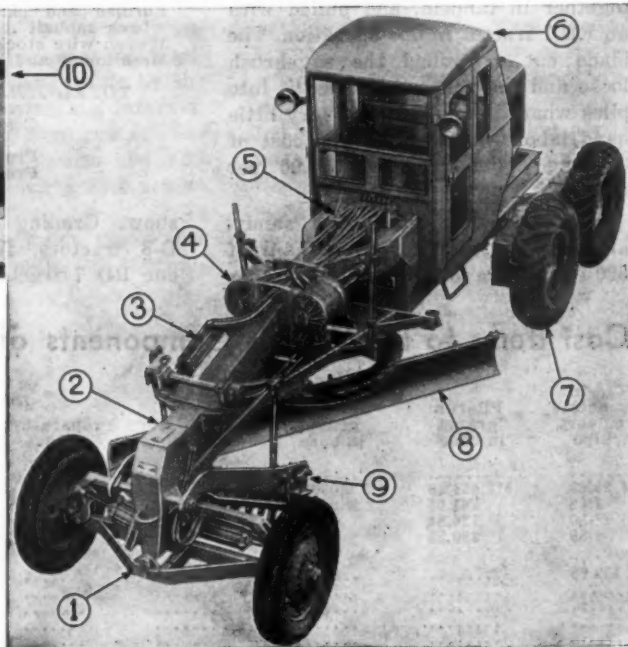
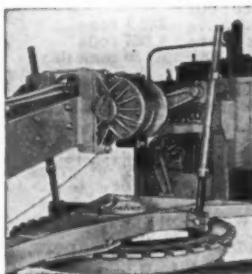
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HYDRAULIC CONTROL
MOTOR GRADER

1. Heavily reinforced solid steel bar front axle is steady driving.
2. Rugged, single-member frame of welded construction.
3. Hydraulic Ram controls scarifier or snow plow.
4. Four simple Hydromotors operate heavy blade from operator's station, with easy control.
5. Hydraulic lines in orderly arrangement and thoroughly accessible.
6. De luxe steel cab. Full, clear vision through safety glass. Insulated roof.
7. WARCO Tandem has chain drive. Hydraulic brakes on two or four wheels. Parking brake on transmission.
8. Heavy moldboard is adjustably mounted and operable in either direction of travel. Blade stays in position where operator wants it.
9. Husky V-Type Scarifier. Teeth individually removable.



WARCO MODEL VD-140 HEAVY MOTOR GRADER

10. Four Hydromotors operate by oil pressure with smooth, sensitive rotary action, for placing blade in any practical position.

HERCULES ROLLERS — LIGHT MAINTAINERS — HYDRAULIC SCOOPS — MULTIPLE BLADE MAINTAINERS — TERRACING GRADERS — ROTARY SCRAPERS

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week, when practical, until Nov. 12. At this time operations were reduced to one 10-hour shift per day due to a scarcity of men and because of winter weather. Equipment was in poor repair, and gave considerable trouble and lost time because of breakdowns. Winter weather with snow and mud caused much lost time and delay. The finishing of slopes and ditches was postponed until Spring.

A gravel pit located about two miles south of the project was stripped and used to furnish the pit-run, screened and crushed gravel required. The gravel pit had been opened on a previous contract and contained good gravel with several times the quantity required. The pit had a 20-ft. face and was overlaid with about two feet of overburden. A tractor and scraper were used in removing this overburden.

Pitrun gravel was loaded with a $\frac{3}{4}$ -yd. shovel and hauled with from ten to fifteen 4-yd. dump trucks to the project where it was spread with a heavy motor patrol and rolled with a 10-ton three-legged roller. These operations were started as soon as sufficient roadbed had been prepared and were completed before the job was closed down for the winter. There were several delays due to the slowness of grading operations.

Data on Crushing Plant

A small crushing plant was erected near the pit and produced the 1"-0" screened gravel and the crushed aggregate acquired for the oil mat wearing surface. Approximately 60% of the gravel passed the 1-in. screen and was used for screened gravel. The remainder was crushed for oiling aggregate. Screened gravel and crushed aggregate were stockpiled near the plant and loaded and hauled to the job the following spring and summer. In producing the required amount of crushed aggregate a surplus of 1"-0" was obtained. Approximately 4000 cu. yds. of material not required on this project was wasted.

The crushing plant consisted of a 28-in. Traylor crusher, two 20x14-in. roll crushers, one 3x10-ft. single-deck shaker screen, one 3'x12" triple-deck vibrator screen, 150 ft. of 24-in., one 160-h.p. diesel motor, one single-compartment bunker of 20 cu. yd. capacity and one 3-compartment bunker, each compartment having 15 cu. yd. capacity. Bunkers were constructed of lumber and were built on the job. A $\frac{3}{4}$ -yd. shovel was used in the pit, loading into two 4-yd. trucks which hauled to the crusher. The crusher operated one 10-hour shift per day, six days per week, and averaged about 22 cu. yd. of crushed



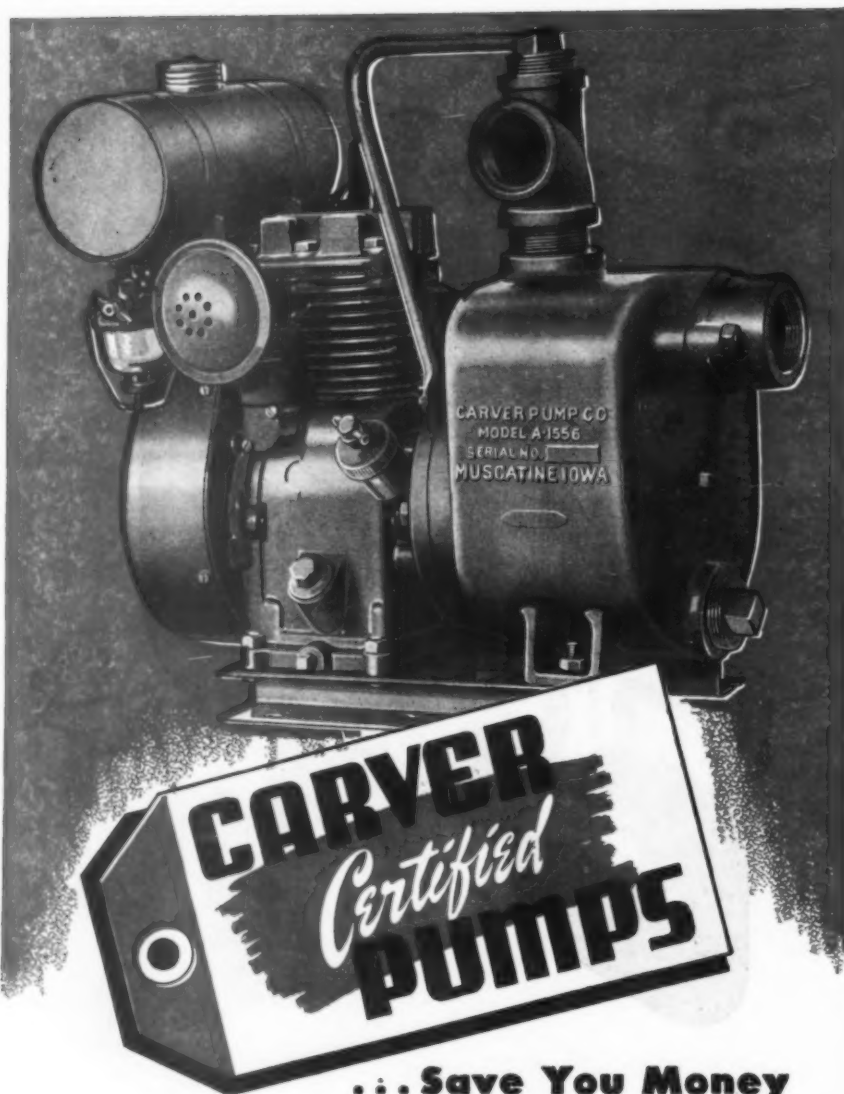
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LOW first cost, fast priming, efficient, non-clogging action mean that Carver Pumps get to work faster, stay on the job longer, and pump more water at less cost per gallon. Top capacity is maintained even after hundreds of hours of toughest service because the wearing surface seal rings are made of Tungsten Carbide that will keep water in and air out, for the life of the pump.

Every Carver Pump carries a "Certified" tag which means that it has been carefully tested and fully meets our high standards for performance on the job. It's your assurance of peak performance on your toughest jobs as well as on the easy ones. For details, see your nearby Carver distributor or write direct.

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Muscatine, Iowa

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gravel and 31 cu. yd. of screened gravel per hour of operating time. There were several short delays due to adverse weather and breakdowns.

The screened gravel was hauled and placed the following Spring. Good weather prevailed and excellent progress was made.

The oil mat wearing surface was applied in May and June. The weather was excellent and fair progress was made. Asphalt was shipped to the nearest rail head and then hauled a distance of 72 miles in two 1500-gal. transports. These transports operated 24 hours a day when required. Asphalt was unloaded at job site into a 6000-gal. storage tank equipped with steam coils, where it was reheated with a retort before spreading.

An abandoned camp was repaired and used for a cookhouse and camp. The cookhouse shows a loss due to the high cost of labor and supplies, heavy consumption of fuel oil during the winter months, and free meals furnished to supervisory employees.

High Wages Paid

The wage scale was high and employees received time and one-half for all time in excess of 8 hours per day and 40 hours a week. As all shifts were on a 10-hour basis, this overtime payment further increased the labor cost per man hour. Key men were experienced in construction methods, but about 60% of the crew lacked experience and were too old or too young. An average crew of 40 men worked 53,928 man-hours and received \$71,479 in wages, an average of \$1.33 per hour. The wage scale was \$0.90 to \$1.05 for common labor, \$1.10 to \$1.35 for truck drivers and intermediate labor \$1.50 to \$1.75 for operators of heavy equipment and other skilled labor. Supervisory employees received from \$300 to \$500 per month.

A fair profit was made on the project due to high bid prices. High labor costs, unfavorable weather conditions, excessive machinery repairs, extra moving expense and overhead caused by the job being closed down during the winter, were factors which entered into the relative high cost of most bid items.

Volume of freight hauled by motor carriers in December dropped 7.8% below November tonnage and 5.7% under December, 1943, volume, American Trucking Associations announced. Truckers in eastern district reported sharpest decline—8.6% November and 8% under December last year.

Equipment Maintenance

Nurse Those Trucks Along!

You'll be lucky to get any new ones soon. These suggestions are taken from ODT's bulletin "Rehabilitation and Preventive Maintenance for Trucks and Buses"

"PREVENTIVE" is more than ever the watchword among all truck owners this year. Preventive operation, as well as preventive maintenance.

Or in simple words baby 'em along a bit more than usual. Preventive operation means elimination of all things which will tend to shorten a truck's life. Chief pointers:

Cut out every unnecessary mile of use.

Reduce dead-head mileage or empty returns by careful planning of work.

Hold down the speed.

Do not load a truck so that any axle or any tire is overloaded.

Most highway and street officials are mindful of the need for these precautions, and contractors, too, have learned a lot lately about going easy on their trucks. But a fresh locker room talk with the drivers and service men is very much in order right now. The boys' memories are short.

Babying along is specially needed to avoid premature failures because of the many substitute materials now being used in truck work. Parts made of certain high alloy steels, such as axle shafts and transmission gears may have tensile strength equal to pre-war alloys, but not always as much shock strength. These parts will do OK up to normal load limits, but won't stand abuse or overload.

Then there's the synthetic rubber tire problem. By now most fleet owners have found by experience what speeds and loads these tires and also recaps are good for. Be sure the limits are being observed. And redouble your precaution, by the way, to see that good carcasses are recapped at the proper time.

Perhaps most important of all is the daily routine of drivers. Each driver should have clearly in mind certain definite easy checks and simple servicing operations that must be done each day before starting out. Some of the daily tasks:

1. Check tire inflation and inspect tires for cuts, damage, or signs

that wheels are out of line.

2. Check radiator for proper amount of water or anti-freeze, fill as necessary.
3. Check oil level in engine, fill as necessary.
4. Check the following items for correct operation:

Windshield wiper.	Engine oil pressure.
Horn.	Generator charging rate.
Lights.	Engine temperature gauge.
Brakes.	

5. At the end of the day's work, or before if necessary, report to owner or dispatcher any mechanical difficulties or defects which have developed and which should be corrected before further use.

It must be brought home to both the owner and the driver that trucks can be easily overloaded in wartime. There is little that the mechanic can do to conserve a vehicle if the owner and driver insist upon overloading, misloading, or overspeeding the truck. Trucks are designed to carry certain

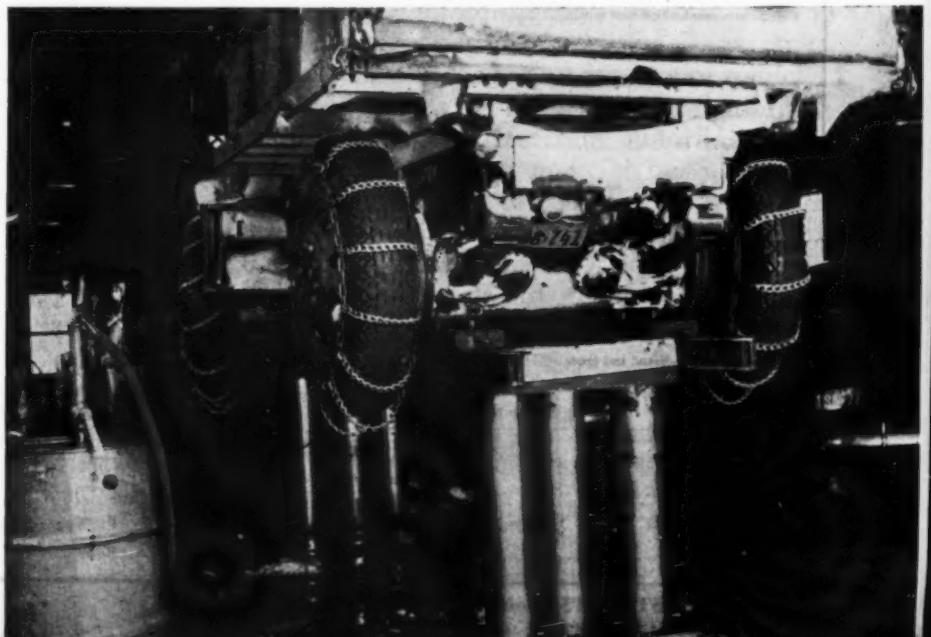
loads, and with correct loads, will operate with reliability and minimum wear of parts. Trucks, however, will carry extreme overloads for short periods of time, but the premature failures can be traced to either abuse or poor maintenance.

Preventive Maintenance

The design of American trucks compels that their chassis and running gear parts be lubricated at approximately 1000-mile intervals. At the first 1000-mile interval, and at 3000-5000-mile intervals thereafter, there are certain services and adjustments which must be made if the vehicle is to operate safely without failure and with a minimum use of replacement parts. If the vehicle is not shopped at these regular intervals, preventive maintenance work obviously cannot be performed.

The aim of preventive maintenance should not be forgotten. It is to so lubricate and service a truck as to result in its operation for many thousands of miles without the use of new parts.

Snow truck on modern 30-ton hydraulic triple-shaft hoist with pressure greasing system (6,000 lb. on the gun), in use for several years by Onondaga County, N. Y., highway department, Ray Traner, superintendent. While this county has a PM system, it depends more on constant, alert supervision, to keep service men and operators doing the things they know they should do but tend to overlook or forget



SUGGESTED PREVENTIVE MAINTENANCE CHECK FORM

PREVENTIVE MAINTENANCE—SHORT GUIDE
750-1250-MILE SERVICE

Vehicle No.

Date this job

Name of shop doing work Date of previous job

Make and model of vehicle Speedometer reading License No.

Owner of vehicle Owner's address

This "Short Guide" is not a complete preventive maintenance service. In addition to doing the service and making the checks indicated on this guide every 1,000 miles, at approximately 5,000-mile intervals, all parts of the vehicle should be cleaned, lubricated, checked or tested, and adjusted or tightened as necessary. Any defects uncovered during the service work, which need repairs, and which cannot be corrected during the preventive maintenance service work, should be scheduled for the necessary shop work.

Reporting Code: ✓ = Checked and found O. K. X = Adjustments or Repairs made. O = Repairs needed.

1. Report engine oil pressure gauge reading with hot engine. Idle speed. lbs.
- Maximum oil pressure. lbs.
2. (a) Report if ammeter or indicator shows that generator is charging at medium engine speed.
- (b) Report maximum ammeter readings. Amps.
3. Lubricate chassis, running gear, steering gear, fan, water pump, generator, distributor and accessories according to manufacturers' lubrication guides.
4. Check lubricant and lubricant level in transmission and differential, and check for leaks. (Report on reverse side, the amount of lubricant added.)
5. Check engine oil. Drain or add as directed by owner. (Report amount of new oil added to crankcase, on the reverse side.)
6. Report if oil filter cartridge was changed.
7. Check oil lines, and engine crankcase, and oil filter gaskets for oil leaks.
8. Check gasoline filters, clean if necessary. Check fuel lines for leaks.
9. Clean and refill carburetor air cleaner.
10. (a) Test antifreeze strength and report freezing point. (In winter season.) °F.
- (b) Report amount of water (or antifreeze) added. Qts.
11. Check radiator for leaks and report.
12. Check water hose, water pump and engine for water leaks.
13. (a) Test battery with hydrometer, and report cell gravity readings.
1. 2. 3.
- (b) Add water as necessary. Report if water was below top of plates.
- (c) Check terminals and hold-down clamps.
14. (a) Report if spark plugs were cleaned.
- (b) If plugs cleaned, report gap setting.
15. Check fan and generator belts.
16. Check fan bearings. Check clearance between fan and radiator. Shake radiator to check for tightness of supports and stay rods.
17. Check clutch pedal lash and clearance with floor. Report pedal lash (free pedal) in inches.
18. Brakes.
- (a) Check brake pedal travel. If more than $\frac{1}{2}$ way down, report so brake shoes can be adjusted.
- (b) Check brake fluid level in master cylinder. Report if additional brake fluid is needed.
- (c) If master cylinder needs brake fluid, check lines and fittings for leaks.

Note on reverse side any other bad mechanical conditions including plugged grease fittings observed during the service work. Also report any defects reported by the driver which were not corrected.

19. Check hand brake adjustment. Report if hand brake lever travels more than $\frac{1}{2}$ of full-travel in setting the brake.
20. Check front wheel toe-in and report amount of toe-in.
21. (a) Check tires for cuts, bruises or bad wear and report any bad conditions, including low air pressure.
- (b) Check dual tires for mating and report.
- L. R.
- (c) Inflate tires and replace valve caps.
- (d) Tighten wheel and rim nuts.
22. Special instructions to be added by owner in regard to special equipment on vehicle or unusual operating conditions.

Defects uncovered which need repairs.

Work performed by

SUMMARY

Engine oil:			
Brand and grade	Amount	Quarts	
Gear lubricant:			
Transmission—Brand and grade	Amount	Pints	
Differential—Brand and grade	Amount	Pints	
Other items			
Service work		Hours	
		Hours	
		Hours	

The techniques of preventive maintenance need constant follow up. They are to uncover misadjusted, loosened, weak, or partially worn spots before failure occurs, and to clean, lubricate, test, adjust, tighten, and service all the parts and the entire running gear in order to prevent failure and wear.

Preventive maintenance assumes that the vehicle is well designed and adapted to the job. No preventive maintenance program will compensate for overloads or abusive service. Failures caused by overload or abusive service may not be repairable in the future because of shortage of parts which may compel the allotment of repair parts to owners who need the parts for normal repairs and reconditioning after long periods of proper service. One cannot be sympathetic with the owner who overloads and abuses his trucks and their tires, even though he may apply the grease gun at regular intervals.

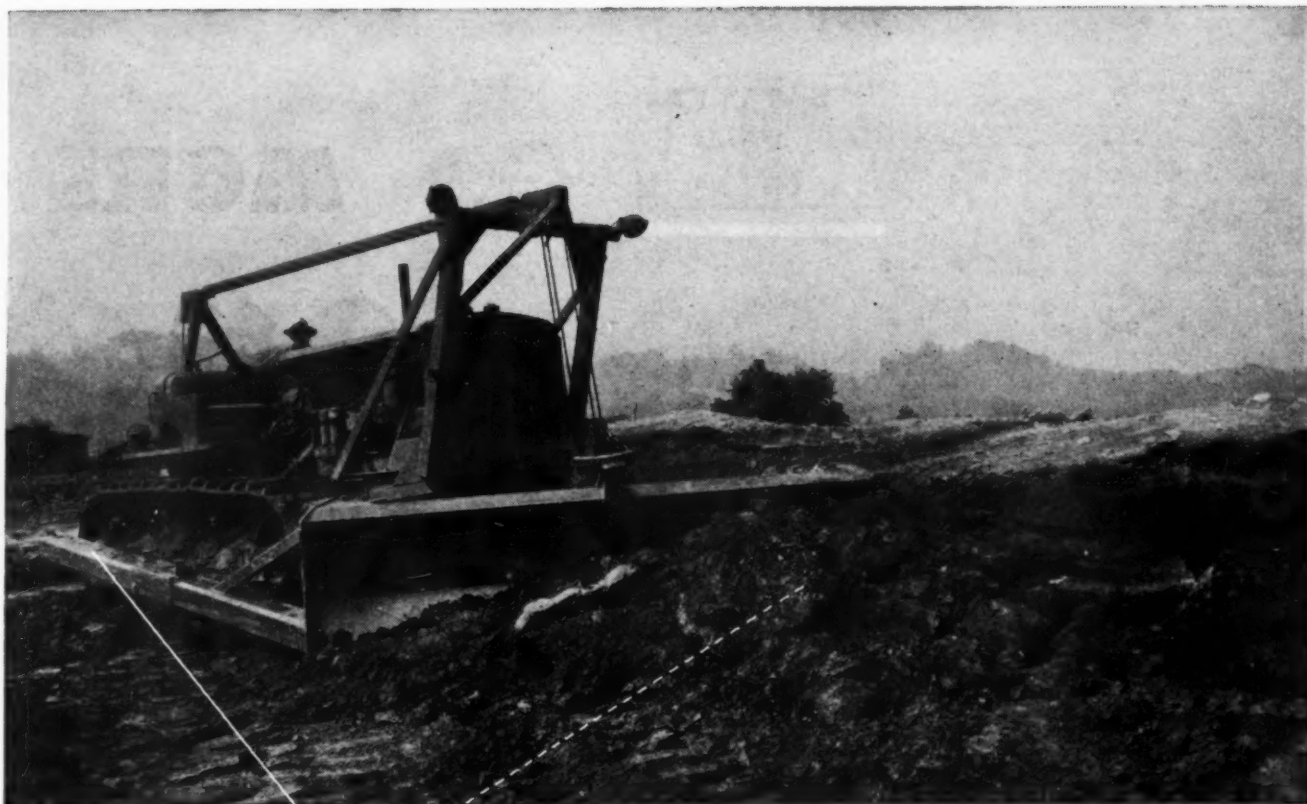
The great principle in preventive maintenance is regularity. The usual basis for preventive maintenance scheduling has been mileage, but mileage records are frequently difficult to follow in scheduling a vehicle into a garage or service station. This is especially true now when garage manpower is scarce and garages are busy. From the shop management viewpoint, a time or day basis is the simplest way of scheduling. Since trucks in any operation usually average about the same weekly mileage, from week to week, it is possible to determine a day and week period upon which the usual 1000-mile, and 3000-5000-mile preventive maintenance service can be performed.

Old stuff, you say, but by no means all highway department and contractors are doing an A-1 job here.

A 1000-mile (750-1250-mile) preventive maintenance service should include more than a mere grease job. The 3000-5000-mile preventive maintenance service should be quite a complete cleaning, lubricating, testing, adjusting, tightening, and minor repair of the entire vehicle. The 3000-5000-mile inspection work, by its very nature, needs to be done at a fairly well equipped garage. Many detailed preventive maintenance guides are available either from truck manufacturers or from large fleet operators. Any owner can determine exactly the operations he wishes to have his garage perform at the 3000-5000-mile period by reviewing in detail such preventive maintenance guides with the garage manager.

There have been many requests for an Office of Defense Transportation standardized preventive maintenance

(Continued on page 92)



Cleaner engines, less wear, lower maintenance costs
with GULF DIESELUBE H.D.

... the improved heavy-duty oil for trucks and tractors

HERE'S THE OIL that sets a new standard of performance for truck and tractor service. Gulf Dieselube H.D. is especially manufactured for lubrication of automotive type Diesel engines, and for gasoline engines operating under heavy-duty conditions.

Gulf Dieselube H.D. is a quality lubricating oil of the improved detergent type — helps keep motors clean, and rings free. It holds carbon and sludge forming materials in suspension, thus preventing harmful deposits in the crankcase and on rings and pistons. It is noncorrosive to all types of alloy bearings, including copper lead and cadmium silver.

U. S. Army Specification 2-104B for heavy-duty

motor lubricating oil is met in every respect by Gulf Dieselube H.D., and large quantities of this oil are being used in practically all war theaters from the Arctic to the Tropics in all types of Army motorized ground equipment—both Diesel and gasoline engines—in trucks, busses, jeeps, tanks, tractors, ambulances and other service vehicles.

This high quality oil is giving outstanding results in all types of contractors' motorized equipment, and in many commercial bus and truck fleets, Diesel powered or equipped with gasoline engines operating under heavy-duty conditions.

To get Gulf Dieselube H.D. now, write, wire, or phone your nearest Gulf office—available in 30 States, Maine to Texas.

GULF OIL CORPORATION • GULF REFINING COMPANY

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
 New Orleans • Houston • Louisville • Toledo



THEY ALL DO MORE ON Firestone



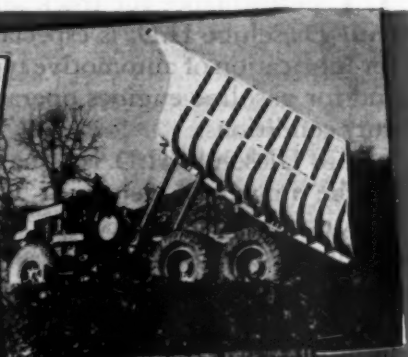
EVERY contractor knows that profits depend upon completing each job with the lowest possible expense. That calls for power-driven equipment mounted on Firestone tires.

Big, tough and rugged, these tires are built specifically for the job of making modern earth-moving equipment more profitable.

Unexcelled for strength and quality, Firestone tires stay on the job longer, on all machines . . . under all conditions. That's why you can depend on them to increase the operating efficiency of your equipment.

For the best in music, listen to the "Voice of Firestone" with Richard Crooks and Gladys Swarthout and the Firestone Symphony Orchestra conducted by Howard Barlow every Monday evening over NBC network.

Copyright, 1945, The Firestone Tire & Rubber Co.



WORK AT LOWER COST

OFF-THE-HIGHWAY TIRES



KEYSTONE SNOW PLOW LIGHTS



Are keeping roads safe, eliminating plowing hazards.



Install these husky weatherproof warnings now, while we can still deliver.

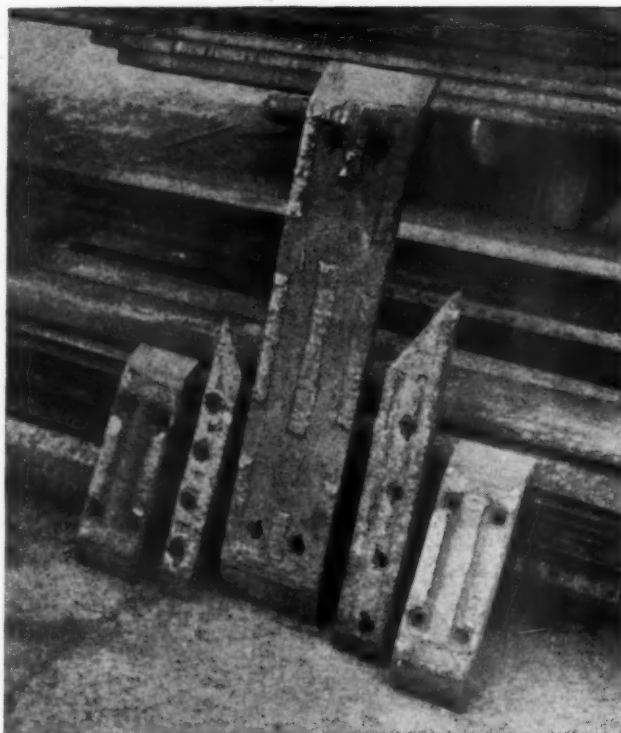


Get the same safety for your department.

KEYSTONE LIGHTS
FLASH TO FRONT & REAR

AUTO GEAR & PARTS CO.

1410 WEST HUNTING PARK AVENUE, PHILADELPHIA, PA.



Hardfacing Pays on Snow Plow Shoes

One of the chores done right along in the California Division of Highway headquarters shop at Sacramento is that of hard-facing plow shoes and end bits. This isn't a particularly novel idea, but this shop's effort to thus prolong the life of shoes is noteworthy because it is done so systematically.

Examples of welded parts are shown in the five pieces photographed.

The shoe shown in the center, for a one-way plow, has been given beads along the center line and each edge, the beads running intermittently but still presenting a large total area of hardfacing to the ground.

The two slender pieces are end bits for a Snogo auger frame, and the shoes on either side are also for Snogo use.

Nurse Those Trucks Along

(Continued from page 88)

guide procedure. As a step toward a uniform procedure, there is offered at this time, a "Preventive Maintenance—Short Guide" for the service work to be done at the 750-1250-mile period. The work outlined covers usual lubrication and, in addition, the defects which are found are reported in order to give the vehicle owner a quick idea of the condition of his truck and its need for any immediate and further maintenance.

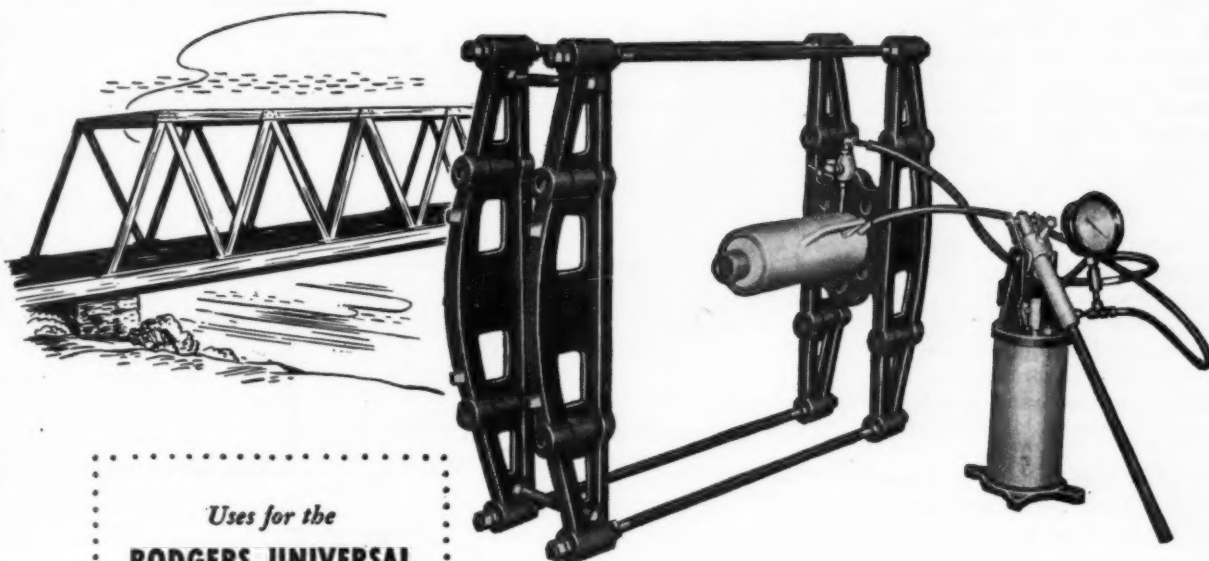
Space is provided at the end of the guide for the addition of specific servicing items which the truck owner may wish to have made because of severe operating conditions or because of special equipment on the vehicle. Such items as 6 and 14, if not necessary at any given preventive maintenance service period, may be crossed out by the truck owner. On the other hand, an item such as the battery may need water oftener than once a month.

NO. 20 OF A "READY-WITH-A-RODGERS" SERIES



"We took a bridge apart with our RODGERS UNIVERSAL PRESS"

... states the superintendent of a construction firm.



Uses for the **RODGERS UNIVERSAL HYDRAULIC PRESS**

- Gear Pulling
- Wheel Press Work
- Jacking Pipe
- Erecting Machinery
- Relocating Machinery
- All-Purpose Jack

THE PROBLEM... removing hinge pins on an old truss bridge.

"On one job alone, dismantling an old truss bridge, our Rodgers Universal Press paid for itself several times over. It enabled us to push out the hinge pins quickly and easily, effecting a tremendous saving in time, labor and material."

"In another instance we used our Rodgers Universal Press with a spread footer to push a concrete wall into proper alignment. That's adaptability—we originally bought this portable press equipment for overhauling and repairing our shovels and crawler-type tracks."

You can use the Rodgers Universal Hydraulic Press in any place or any position where pulling, pressing, or lifting power is needed. When emergencies arise, be ready with a Rodgers!

*If it's a Rodgers,
it's the best in Hydraulics.*



4 SIZES—one for your job... write today for full information!

RODGERS HYDRAULIC, INC.

7401 Walker Street, St. Louis Park, Minneapolis 16, Minnesota.

Wisconsin County Gets New Shop

COUNTY highway officials over the U. S. who have ideas for expanding or rebuilding their shop and garage facilities, will be interested in the new shop building at Richland Center, Wis. (Richland County.)

The building when completed this winter will consist of a one-story storage area 80 x 125 ft. leading into a 2-story section containing a modern repair and machine shop and separate rooms for welding, tires, parts, and office space.

The mechanical equipment to be installed will depend on availability. It will include a 10-ton hand-operated overhead crane, motor-operated overhead doors, steam heat supplied from a municipal building adjoining, and such modern touches as ceramic tiled toilet walls and fluorescent trough lighting in office and shop.

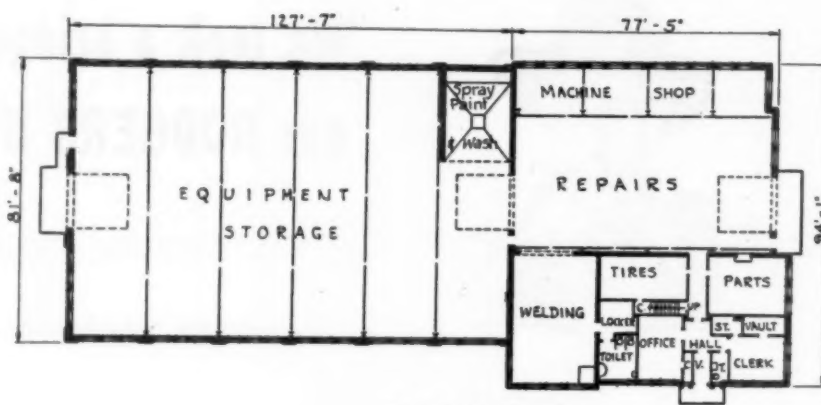
In commenting on the importance of getting modern shop facilities, Highway Commissioner W. V. Robinson said, "We maintain 130 miles of state and 300 miles of county highways, 150 miles of prospective highways, both summer and winter, besides doing quite a bit of township work.

"Our shop foreman, B. D. Berger, has been with us since 1922 and his ability to plan out and make parts for our equipment (old and getting older) has come in rather handy during these times.

"This is my 26th year in this position, and this is the second shop I have had the pleasure of helping build, the old one was built in 1922. Before that time we had only unheated sheds and very little to do with."

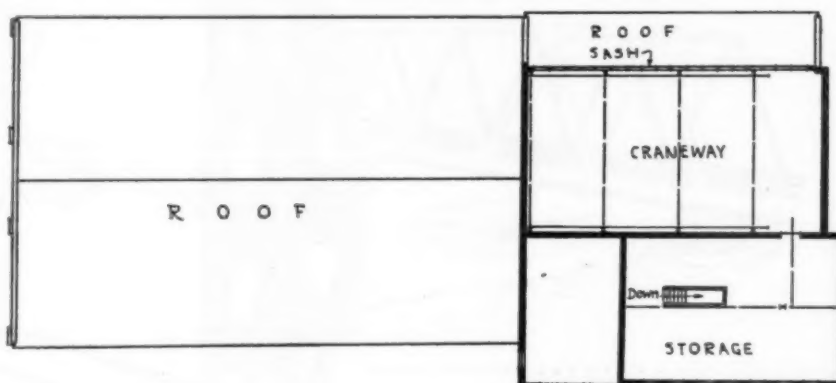
Equipment Owned by Richland County Highway Commission

- Trucks**
 3—All wheel drive 4-8 ton
 11—Rear wheel drive 3-6 ton
 12—Rear wheel drive 2-3 ton
 4—Pickups
 1—7½ ton wrecker with crane and 10 ton winch
 1—Buick car



FIRST FLOOR PLAN

10 20 30



SECOND FLOOR PLAN

10 20 30

Grading and Patrol Equipment

- 1—RD 8 tractor
- 1—RD 7 tractor
- 7—Motor patrol graders
- 1—½-yard shovel
- 1—¾-yard shovel
- 2—Air compressors
- 5—Jackhammers
- 2—Power mowers
- 1—8-yard carryall scraper
- 1—Portable crushing plant
- 1—5-7 ton tandem roller
- 1—1000-gal. asphalt distributor
- 1—Tank car heater
- 2—Large moldboard snow plows
- 6—Small moldboard snow plows
- 9—Large V snow plows
- 2—Side wings
- 2—Asphalt heaters
- 9—Sand or chip spreaders
- 1—Elevating grader
- 2—Construction graders
- 1—Force feed loader
- 1—Pile driver

Shop Equipment

- 1—Power hacksaw
- 1—24-inch lathe
- 1—16-inch lathe
- 1—Miller
- 1—Shaper
- 1—Large drill press
- 1—Small drill press
- 2—Electric welders
- 2—Acetylene welding sets
- 1—75-ton press
- 1—Re-boring bar
- 7—Electric drills
- 3—Electric grinders
- 2—Electric hand grinders
- 1—Valve grinder
- 1—Seat grinder
- 1—Pin and bushing grinder
- 1—Bit grinder
- 1—Forge
- 1—Drill sharpener and shank
- 1—Heavy bar cutter
- 1—Metal shears
- 4—Hand operated chain hoists
- 1—Light plane for field work
- Gasoline and fuel oil bulk plant 50,000 gal. tanks

Richland County's new shop, whose wartime completion spotlights the need of similar expanded facilities in hundreds of American counties




ANDERSON

SNOW PLOWS

AUTOMATIC-TRIP REVERSIBLE and ONE WAY



SHOWN ABOVE—ONE way tripping snow plow for heavy duty trucks. Also made in proportional size and strengths for light trucks.

Suitable for State Highways, City Streets, Airports, Parks, and Industrial plant plowing, they are in use from Alaska to the Carolinas—in all parts of the country's snow belt.

You can depend on an Anderson plow.

ANDERSON ENGINEERING Co.
Engineers & Manufacturers

21 Charles St.
Cambridge 41, Mass.

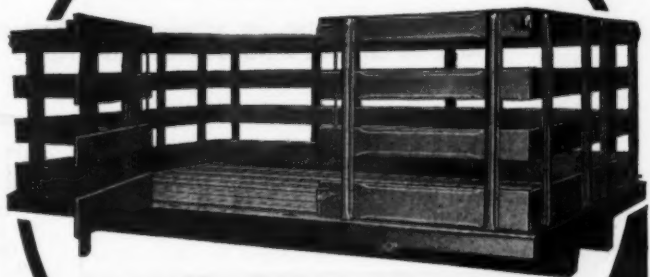
MORE AND MORE
Extra Value
Extra Service



PERFECTION
Series -154
DUMP BODIES

This new series of dump bodies has greater rigidity and durability than any previous models of the same capacities. Welded construction throughout. Capacities, 2½ and 4 cu. yd. Lengths, 7 to 10 feet. Body width, 72 inches.

PERFECTION
Series-7400
STEEL PLATFORM STAKE BODIES



Built to give maximum loading space. New features such as low mounting height and all-steel understructure assure definite working advantages and repair savings.

WRITE
FOR
BULLETINS
AND NAME
OF NEAREST
DISTRIBUTOR

THE PERFECTION STEEL BODY CO.
GALION, OHIO



PERFECTION
TRUCK BODIES AND HOISTS

ROADS AND STREETS, February, 1945



Is your Construction Job suffering from "Diaphragmitis"? Is your Diaphragm Pump worn out . . . hard to handle . . . temperamental . . . old fashioned . . . cumbersome? In other words, is your Diaphragm Pump **COSTING** money instead of **MAKING** money?

Diaphragm Pumps have a definite place in the Construction Field. They can handle water that is laden with **SLUDGE . . . MUD . . . GRAVEL . . .** and **DEBRIS** WITHOUT damage to themselves!

Novo has engineered the ideal Diaphragm Pump. The Novo Diaphragm has an Eccentric Drive instead of a walking beam. This Eccentric Drive means **FEWER** moving parts . . . **SHORTER** over-all length . . . **LESS** dead-weight. Hundreds of these Novo Diaphragm Pumps are serving our War Aims . . . they can do as well for **YOUR** Post-War Aims!

Is your Construction Job suffering from "Diaphragmitis"? Here's the cure . . . a **NOVO DIAPHRAGM PUMP!**



For full particulars about the Novo Diaphragm Pump, write us for Bulletin #167-C.

Associate Member of A.E.D.

NOVO ENGINE CO.

LANSING 5, MICHIGAN



Self Priming Pumps



Hoists



Engines

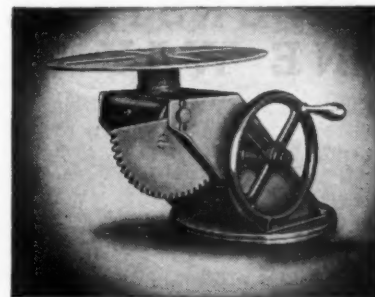


Diaphragm and Pressure Pumps

New Equipment and Materials

New Welding Positioner

A new hand-operated positioner for facilitating welding has been added to the line of the Ransome Machinery Co., 172 Rock Ave., Dunellen, N. J. It is stated to be especially adaptable for stelling and other hard-surfacing of worn out construction equipment parts. The capacity of this



Bench model IH positioner

bench model is 100 lb., with the center of gravity 3 in. above table. It has a tilting range of 150 degrees, revolves 360 degrees, and can be locked in position at any degree of tilt. The 16-in. table top is equipped with 9/16 in. slots. Swivel base is available if desired.

▼

New Loading Device

A new scoop loading unit for attachment to motor trucks has been produced by Truk-Loader Co., Tiffin, O. As will be noticed from the illustration the unit is attached to the truck body and its operations are controlled by the body. The standard bucket is ½ cu. yd. capacity. A special bucket for handling leaves and snow is available. This has a capacity of 1.1 cu. yd. The unit can be attached to all makes and models of trucks.



The Truk-Loader



DAVEY AUTO-AIR MOBILITY SAVES TIME, MONEY, MANPOWER

On construction jobs where air is needed in one place for days or weeks, the conventional, trailer-mounted Davey Air-Aristocrat Compressor does a job second to none. But most construction compressed air jobs are small and can be done **FASTER, MORE ECONOMICALLY, WITH LESS MANPOWER** by taking advantage of the **MOBILITY** of the DAVEY AUTO-AIR COMPRESSOR.

Consider These Advantages—The truck-mounted Davey Auto-Air will go anywhere as fast as the truck can go . . . Auto-Air leaves two-thirds of the truck for men, tools and materials . . . reduces original and maintenance costs . . . can be mounted on your truck locally.

For full information on the complete Davey line of Compressors, Truck Power Take-Offs, Pneumatic Saws and additional pneumatic engineering data, write today for free catalog E-172.

D-16-15

DAVEY Compressor Co.
KENT · OHIO

DEALERS IN PRINCIPAL CITIES



BAKER "BABY" BULLDOZERS

are saving time and manpower at plants "neck deep" in war work. This sturdy, easily maneuvered bulldozer works in close quarters, indoors or out. Made for all industrial wheeled tractors. Operates with hydraulically controlled lift and down pressure on the blade. Tractor can be used for other work without removing blade. Ask for Bulletin No. 834.

THE BAKER MFG. CO.
506 Stanford Ave.
Springfield, Illinois

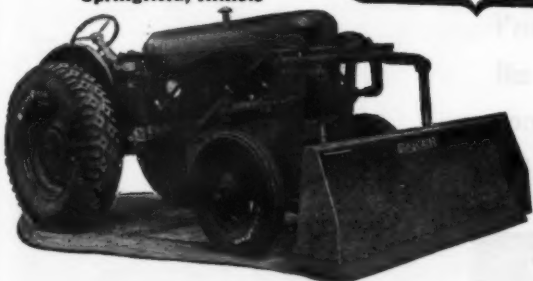
Hundreds of Uses including—

Cleaning up debris on plant floors, in yards and in barge and ship holds.

Helping shovel loading in coal and material yards.

Piling scrap, etc. Removing snow. Backfilling trenches and ditches.

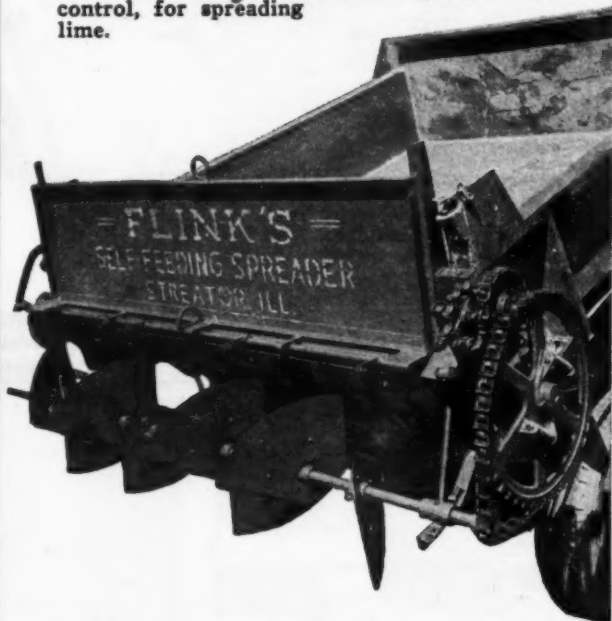
Leveling and spreading at fills. Moving or piling sand.



BUDDOZERS · SNOW FLOWERS · **BAKER** · CONSTRUCTION EQUIPMENT

HOW FLINK ONE MAN Material Spreader DOES BETTER JOB

Spreads forward or backward, in even layers, wet or dry materials, thick or thin, as desired. Spreads full or half width of street. Efficiently handles all materials up to 1". Built for tough road building and maintenance jobs, for ice control, for spreading lime.



Flink spreaders do a better job for definite reasons:

1. **POSITIVE AGITATION** by rugged, simple, finger type agitators.
2. **ADJUSTABLE GATES**, set before spreading, give accurate control of amount spread.
3. **HI CARBON STEEL FANS** scientifically placed and angled, thoroughly "mix" material dropping through gates, deposit it in even layers on spreading surface. No thick and thin spots.
4. **ELECTRICALLY WELDED**. The Flink spreader is a rugged piece of commercial equipment, built of steel, for hard use.
5. **FASTER**. Spreads at 12 to 20 miles an hour. Can be operated by driver from cab who can throw spreader in and out of action as truck is in motion.
6. **NO HELPER**. The Flink is self-feeding. No shoveler on back to "rest up" or "warm up".
7. **DOES NOT LIMIT USE OF TRUCK**. Truck can be dumped same as with regular end gate or spreader can be replaced by original end gate in 5 minutes.

Write for literature.

The FLINK COMPANY

508 VERMILION

STREATOR, ILLINOIS

ROADS AND STREETS, February, 1945

Shut Out the Weather with SISALKRAFT



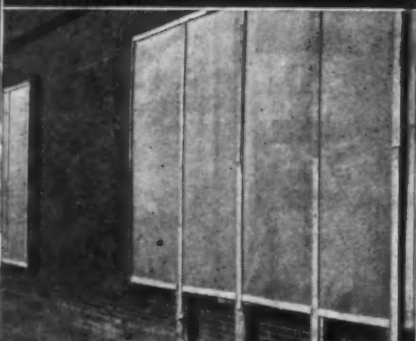
SISALKRAFT confines steam better than canvas for winter curing. Costs less — saves fuel.



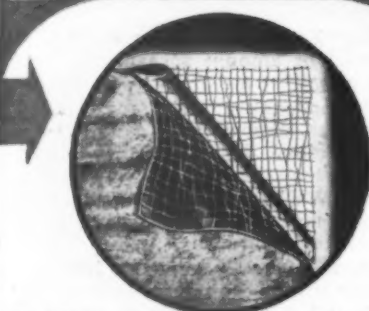
This is a SISALKRAFT-enclosed job that withstood a heavy gale.



Materials stored in the open are protected from weather when covered with SISALKRAFT.



Cover window openings with SISALKRAFT. It won't rip easily or ravel and can be used again and again.



Sisal fibre reinforcement for strength — special asphalt for waterproofness — kraft paper treated to make it scuff-proof — sealed by heat and pressure — to produce SISALKRAFT.

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY
In Canada Write to Alexander Murray & Co., Limited, at
Montreal-Toronto-Halifax-Saint John-Winnipeg-Vancouver

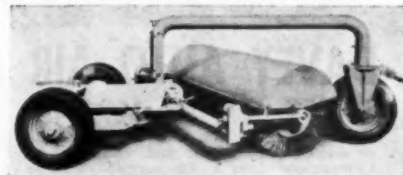
Manufacturers of
SISALKRAFT, FIBREEN,
SISAL-X, SISALTAPE AND
COPPER-ARMORED SISALKRAFT

USE windproof SISALKRAFT
for every cover-up job —
to shut out the weather and
hold in the heat. And don't
forget to cure and protect all

concrete with time-
tested SISALKRAFT.

New Road Brooms

Two new models—106 and 108, of Littleford road brooms have been announced by Littleford Bros., Inc., 454 E. Pearl St., Cincinnati 2, O. Model 106 illustrated here is the traction driven broom; all the power is produced from the rear wheels. The Model 108 is a power driven broom similar to the traction driven, yet is powered by an engine mounted at the rear.

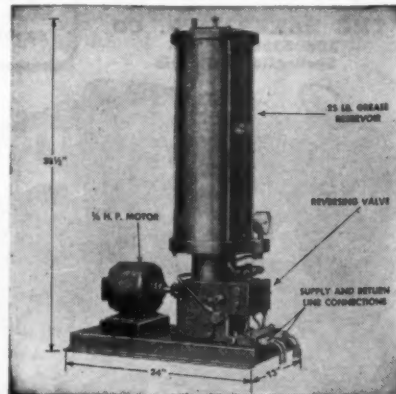


Model 106 road broom

The brooms are two-way brooms that can be changed from one sweeping position to the other in two seconds time. These brooms also contain the exclusive Littleford features such as hydraulic lifting arrangement, mono-frame, etc. Both can be turned in a small radius due to their three-wheel construction. Sprinkling system can be added to both models and a blower attachment can be added to the power driven broom.

New Pumping Unit for Lubrication

A new pumping unit for centralized lubrication has been announced by the Farval Corporation, 3249 E. 80th St., Cleveland, O. This is a small size, double plunger, slide valve type of pumping unit which provides a positive high pressure pump for the handling of all types of lubricants without the use of springs, check valves or stuffing boxes. The complete system will handle either oil or grease and requires no attention except the renewal of the lubricant sup-



Automatic central pumping unit DC-25



When in need of heavy machinery trailer information

—Write—

La Crosse Trailer & Equipment Company
LA CROSSE - - - WISCONSIN

Three semi trailers shipped recently to one of our southern dealers:

Left—DF6 18-semi.
Center—DF6T 18-semi.
Right—DF4 11-semi.

These are all very popular models.

Remember the name—

LA CROSSE

GRUENDLER CRAFTSMANSHIP

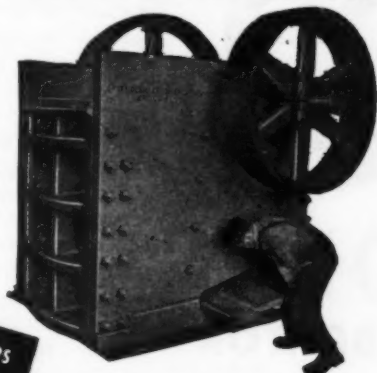
Serving Industry over 50 Years

Peak Production!

150-200 TONS OF CRUSHED ROCK PER HOUR

Steam Shovel
sizes to 5" to 6"
minus in one-
operation

These heavy plate and cast steel constructed roller bearing JAW CRUSHERS have tremendous crushing power. Built to take it for continuous operation with minimum maintenance. Built in all sizes, stationary or portable.



Complete weight of 25x42
JAW CRUSHER is 54,200 lbs.

Mfrs. of Double Roll Crushers and
Hammer Crushers for Secondary
Crushing requirements.

BULLETIN MAILED ON REQUEST



GRUENDLER

CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

Streamlined INSIDE for Higher Efficiency and Lower Operating Costs

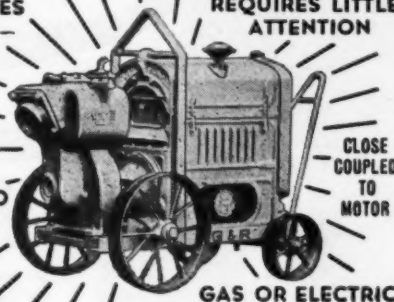
RUGGED SIMPLICITY OF
DESIGN ELIMINATES
RECIRCULATION -

DELIVERS
GREATER VOLUME
PER GAL. OF GAS

NO ORIFICE OR
PRIMING VALVES TO
CLOG OR JAM

CAPACITIES UP TO
125,000 GPH

NEVER LOSES PRIME
REQUIRES LITTLE
ATTENTION



CLOSE
COUPLED
TO
MOTOR

GAS OR ELECTRIC

Streamlined where it counts, you can't clog a Gorman-Rupp Self-Priming Pump. Unequalled in rugged efficiency, gallonage or continuous hours. A size and type for every need.

THE GORMAN-RUPP COMPANY, MANSFIELD, O

GORMAN-RUPP
SELF-PRIMING CENTRIFUGAL PUMPS

small TRAILERS too ... embody ROGERS



**EXPERIENCE • built it •
PERFORMANCE • sold it •**

time-proven fundamental features of design which have been tested under all kinds of most-severe service.

In any Rogers Trailer you obtain the maximum in proven construction, in ease of control, in safety and in all round value.

ROGERS BROTHERS CORPORATION
110 ORCHARD ST. • ALBION, PA.

for GENERAL CONCRETE CONSTRUCTION



JACKSON CONCRETE VIBRATOR FLEXIBLE SHAFT

This member of the JACKSON Pioneer Line — Model FS-6A, handles widest range of work in stiffest concrete, because it has variable speed control up to 7500 V.P.M. Three vibrator head sizes for thick to thin sections. Flexible shafting ($\frac{1}{2}$ " core) in 7 to 14 ft. lengths up to 28 ft., with heavy-duty couplings. 3 H.P. Wisconsin engine. Automatic clutch saves engine wear. Full swivel, dirt-proof turntable base. Optional wheelbarrow with drop-down handles. Grinding heads available for wet or dry rubbing. **Plus** finest construction throughout, guaranteeing famous JACKSON Dependability and Performance with ordinary maintenance.

**THERE IS A RIGHT JACKSON
CONCRETE VIBRATOR
FOR EVERY JOB**

For light work and hard-to-get-at places, buy this JACKSON Model FS-4A flexible shaft vibrator. 110-120 Volt A.C., D.C., Universal Motor, $\frac{1}{2}$ H.P. at 6500 VPM. Vibrator head sizes $1\frac{3}{8}$ " x 17" or 10". Shaft lengths — 24 in., 39 in., 7 ft., and 14 ft.



Model FS-5A JACKSON flexible shaft vibrator. For heavier work than FS-4A above. Motor is 110-120 volt A.C., D.C., Universal, $\frac{3}{4}$ H.P. at 7000 VPM. Shaft lengths up to 21 ft. Head sizes $2\frac{3}{8}$ " or $1\frac{13}{16}$ " diameter. Bowl type base.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

ply in the reservoir. Similar to the larger Farval heavy duty units, this central pumping unit delivers lubricant under pressure to all bearings in the system through two main supply lines serving a Farval Dauline measuring valve at each bearing. Frequency of operation is controlled by an electric time clock. A suitable signal device is available to indicate any interruption to the normal operation of the system. For individual machine lubrication, this central pumping unit can also be furnished with rotary drive and with hydraulic timing. With this arrangement, the unit will start and stop with the equipment served.

Air Compressors

Application of engine builders' precision methods to the manufacture of air compressors, begun during the war by The Jaeger Machine Co., Columbus, O., will be continued in the production of a complete line of both portable and stationary models of 60 to 500 cu. ft. capacity. By balancing the low and high compression cylinders in a "W" shaped bank and micro-honing and lapping in parts to close automotive tolerances, the resulting efficiency is said to permit full rated output of air with 20 per cent to 30 per cent lower piston speed and the power plant operating well below its capacity at any altitude in the United States. Advances in air cooling, also derived from war experience, have simplified control of the heat and condensation which result when air is compressed. Air-animated "Tough Swedish Twin" valves of unusual size and high lift insure free air flow without back pressure. By this valve action, in combination with improved cylinder radiation and more efficient intercooling, air compressed to 100 lb. per square inch is stated to be held to a temperature within 100° of the ambient atmosphere. Condensation and oil vapor are controlled by automatically unloading and draining the corrosive fluid from the intercooler system during each idling period. The compact "W" arrangement of the



Jaeger air compressor

Speed Up = HANDLING OPERATIONS



Ingenuity in developing amazing portable docks speeded the invasion of Europe. Similarly inbuilt features of design in Owen Buckets speed up the digging and handling capacities of these popular buckets. Buy Owens for resultful operation.

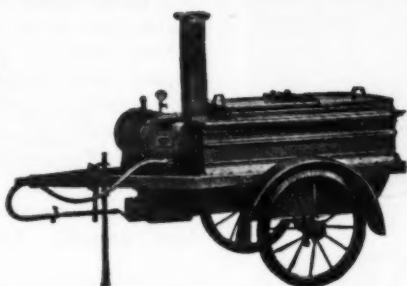
The OWEN BUCKET Company
6070 Breakwater Avenue • Cleveland, Ohio
BRANCHES: NEW YORK PHILADELPHIA CHICAGO BERKELEY, CAL

OWEN BUCKETS

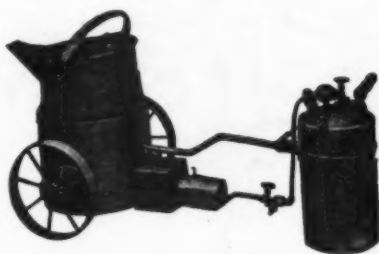
A MOUTHFUL AT EVERY BITE

CONNER'S HEATING KETTLE

For speedy heating of tar and asphalt—



Use this CONNER oil-burning Patrol Patching Heater on the *small* job and this CONNER oil-burning kettle for *large-quantity* production.



Write for catalog showing our full line of tar and asphalt heating kettles, spraying attachments, pouring sets, etc.

CONNER CONSTRUCTION Co.
3900 North Second St. Philadelphia, Pa.

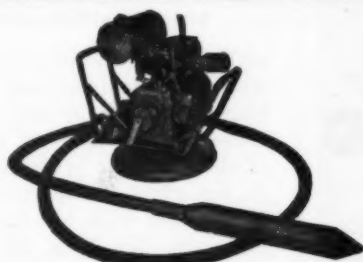
Announcement to

CONTRACTORS and ENGINEERS

During the past three years, while new Byers shovels and cranes have not been available to commercial users, our company has been devoting its entire effort to: (1) meeting enlarged production schedules for machines for our armed forces; (2) maintaining prompt parts service to owners, and (3) following our long established policy of continual improvement of our products.

When commercial shipment of shovels and cranes again becomes possible, you will want to look over the greatly improved models of Byers shovels and cranes before you buy.

BYERS **CRANES AND SHOVELS**
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD



Concrete VIBRATORS and GRINDERS

Write for Circular on types, sizes and Prices

ELKHART **White Mfg. Co.** INDIANA



UNIT 5 TON **mobile CRANE**
SELF-PROPELLED

Powerful, fast-stepping Mobile Crane... one-man operated... for "on and off" highway operations... simple to operate... (eliminates cut-up terrain, mutilated concrete docks and runways.) Write for particulars.

UNIT CRANE & SHOVEL *estd* MILWAUKEE 14 WISCONSIN

SINCE 1890

"SOMEWHERE
IN ENGLAND"

Ever since men now old were young, Buffalo-Springfield rollers have been "old reliables" in the field of road construction. No other make can match them for low cost of maintenance over the years—in peace or in war.

Soon still more efficient models will appear on The Buffalo-Springfield line, ready to chalk up still higher performance figures—still lower maintenance costs.



Stand by for announcements.

THE BUFFALO-SPRINGFIELD ROLLER CO.
SPRINGFIELD, OHIO.



Para-Plastic

Hot poured
"MIRACLE SEAL"



Manufactured by SERVICISED to conform to Federal Spec. SS-F-336 and C.A.A. Spec. P-605, Para-Plastic is recognized in the construction engineering field as a positive water seal for concrete and general construction.

Pioneers in the manufacture of Approved Construction Materials for over twenty-five years.

SERVICISED PRODUCTS CORP.
6051 West 65th Street, Chicago 38, Ill.

ROADS AND STREETS, February, 1945

compressor cylinders permits use of a short crankshaft and closely spaced main bearings and also provides easy access to the valves and parts. Valves and pistons are interchangeable throughout. All units have full force feed lubrication. The bearings and Twin Disc multiplate clutches are designed for lifetime service and grouped control panels, unusually large air receivers, sectional radiator grills, extended lubrication fittings and protected fuel tanks are standard features. Gas, diesel or electric powered models are available with either direct or belt drive.

New Metalizing Gun

A new metallizing gun, specially engineered for high speed production spraying of low melting point metals, has been added to the line of Metalizing Engineering Co., Inc., 3814 30th St., Long Island City 1, N. Y. It is stated that using 1/8 in. zinc, tin, lead, solder, babbitt, cadmium, or fine gage copper and copper alloys, this new gun exhibits spraying speeds which exceed any yet attained with these metals. Regardless of the type of wire employed, no gear changes whatsoever are necessary to achieve these high speeds. Any spraying speed



Metco type 3E metallizing gun

within the prescribed ranges is automatically obtained, and maintained hour after hour, by the patented controlled power unit—an integral part of the gun. Air pressure fluctuations do not affect its operating efficiency. In common with all Metco metallizing guns, the Type 3E is equipped with a universal gas head, which allows the tool to be operated on any commercial gas—in conjunction with oxygen and compressed air. A duplex mounting fixture is provided for permanent installation on the production set-up.

New Crane

A new crane, having a full vision cab affording the operator an unobstructed view in all directions at all times has been brought out by the Unit Crane & Shovel Corp., Milwaukee 14, Wis. The design of the cab has been accomplished without sacrificing weight, capacity, or head room and is made possible by the compact design of Unit main machinery. This self-propelled, one-man operated crane is powered by a single engine, either gasoline or diesel, and



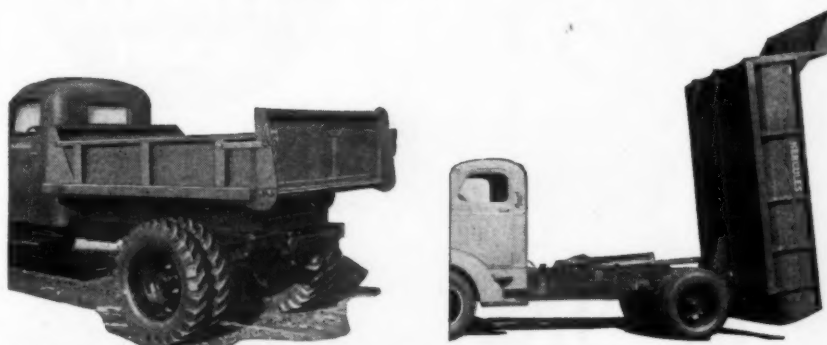
New Unit Crane

is equipped with an all-purpose, jib-extension boom for multiple yard operations. The rated lifting capacity of the crane is 5 to 7 tons from the 30-ft. straight lattice boom, and the 8-ft. jib extension will easily handle 4,000 lbs. The jib is designed for close-in operations where ordinary angular straight boom lifting would be prohibitive. With this dual purpose boom each cargo hook works independently . . . one hook always available for light, close-up work and the other available for heavy lifts.

Standard Steel Dredges

Hydraulic, dipper and clam-shell dredges of completely integrated and standardize design are scheduled for production at the Fort Wayne, Ind., plant of the American Steel Dredge Co., as soon as present commitments on barges for the Army will permit. All dredges will have bolted sectional steel hulls and are so designed that all sub-assemblies and equipment can be conveniently transported overland to remote locations, or shipped to foreign countries as hold cargo. The largest single, component unit can be handled by portable crane equipment. The line of hydraulic dredges will include 6, 8, 10, 12, 16 and 20-in. sizes. The line of standard dipper and clam-shell dredges will have a capacity range from $\frac{1}{4}$ to 3 cu. yd.

For Every Dumping Job, There's A HERCULES HYDRAULIC Dump Body and Hoist



Hercules Removable Side Rub Rail Body With Hinged Rear Corner Post.

Hercules High Dumper-Power Up, Power Down, with 78° dumping angle. Hoist capacity 12 tons.

Many other body styles, in many sizes, and 6", 7", 8" and 10" Hoists, are available.

A HERCULES HYDRAULIC BOOSTER HOIST

Makes any
Truck A
DUMP
TRUCK



UNLOAD the EASY WAY! SAVE TIME, MANPOWER and MONEY by installing Booster Hoists under your Stake, Platform, or Special Bodies. 50° Dumping Angle will dump any material such as Coal, Grain, Earth or Sand. See your Hercules Distributor or Write

HERCULES STEEL PRODUCTS COMPANY GALION, OHIO

Manufacturers of Hercules Hydraulic Hoists, Dump Bodies, Split-Shaft Power Take-Offs and "Power-Chute" Hydraulic Coal Unloaders

ERIE
PORTABLE PLANT
MAKES CONCRETE
ON THE JOB



• Make 20 to 40 yards of specification concrete per hour on the job. One-man operation and a helper to handle cement bags. One hour to set up. Moves from job to job. Write for booklet.

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AggreMeters • Buckets • Concrete Plants • Traveling Cranes



SECTIONAL
TYPE
**All-Electric
ASPHALT
PLANT**

ELECTRICAL EQUIPMENT *Completely Installed*



MODERNIZE YOUR OLD ASPHALT PLANT

—by installing FLUIDOMETER, the automatic metering system. Saves time and operating costs, insures uniformity of mix. For all types of plants.

This sectional type H & B asphalt plant is completely electrical in operation, with all units driven by individual motors—no chains or countershafts. All units are wired completely at our factory. Once the plant is assembled you are ready to hook up to the power line and start operating. The plant is quickly assembled and disassembled, and easily portable. Refinements in design include a larger fan, new horizontal cyclone dust collector and new type screen, making for greater compactness and increased efficiency. Write for complete information.

HETHERINGTON & BERNER INC.

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FOR BEST RESULTS... HOT MIX — BATCH MIX



VULCAN PAVEMENT AND CLAY DIGGING TOOLS

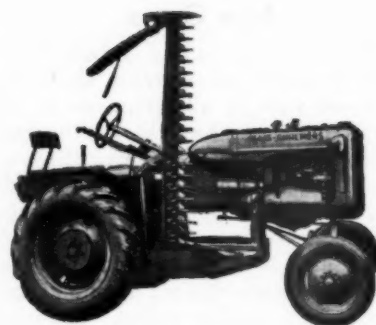
ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.

VULCAN TOOL MFG. CO.
QUINCY, MASS.

New General Purpose Mower

A new heavy duty, general purpose mower for highway, park, golf course, airport or miscellaneous service has been announced by Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Mounted as a unit on a Model "B" Allis-Chalmers tractor, the mower has a variety of travel speeds for all conditions, and possesses unusual stability for operations on extreme slopes and difficult angles. A 5-ft. heavy duty cutter bar is within full view of the operator and is smoothly and easily raised and lowered by a power hydraulic lift. The inner shoe



Model B Mower

is located outside the rear wheels and can be raised a distance of 12 ins. by a conveniently located hand lever. The sickle delivers a full cutting stroke through a wide range of positions from 45° below horizontal to 60° above tailoring it for highway mowing, cutting slopes and banks, hedges and shoulders. To insure protection for the sickle when obstructions are accidentally encountered, the belt drive slippage provides a safety relief and eliminates any possible damage. The mower design leaves the drawbar open enabling the tractor to pull gang-mowers or other equipment without removing the cutter bar. Complete specifications on this new Model "B" General Purpose Mower, can be obtained from Allis-Chalmers Tractor Division, Milwaukee 1, Wis.

New Centrifugal Pump

A new line of automatic centrifugal pumps has been announced by the Barnes Manufacturing Co., Mansfield, O. This post-war line complete from the 1½ in. through the 6 in. size is now available for shipment to Barnes distributors. Among the advantages claimed for this new line are: A positive high speed automatic prime with no moving parts in the pump mechanism. A precision ground, polished, and case hardened positive water seal. Direct-in-line suction flow. Water detours eliminated and friction loss cut; high efficiency results. New type non-clogging impeller with smooth opera-



Barnes Flash Model 3M. F. B. Hout (left), vice-president in charge of sales, is getting the details of this latest Barnes design from G. K. Eggleston, vice-president in charge of engineering

tion and maximum water and solid handling. Modern design provides simple, sure, and low cost impeller adjustment. Scientifically designed, rugged construction Volute eliminates angular corners and assures trouble free operation.

New Mortar Cement

Atlas Mortar cement, a new product of the Universal Atlas Cement Co., is now ready for shipment from all the company's plants. It is the result of years of research, the object being to produce a mortar cement which would be outstanding not only in some single essential but in all the characteristics desired by bricklayers, masons, and masonry contractors. The cement is stated to be a plastic, smooth and buttery-like product, which spreads and trowels easily. Another point is yield—the amount of mortar produced by a bag of cement and the number of bricks, blocks, tile or other units that can be laid with the resultant mortar. Among other attributes underscored for this cement are low volume change; color properties entirely acceptable to the trade; durability in accord with a quality cement; and strength that meets all requirements. The cement complies with the specifications of the Federal government and the American Society for Testing Materials.

Obituaries

CALVIN N. KROSCHE, 53, county engineer of Martin County, Minnesota, died Jan. 19, in Fairmont, Minn.

A. CHARLES IRWIN, formerly assistant subway engineer in the Chicago department of subways and super-highways, died Jan. 30. Before his association with the city engineering department he had been manager of the railway bureau for the Portland Cement Association.

THOMAS RIGGS, 72, Commissioner International Boundary Commission, died Jan. 16 in Washington, D. C. In 1903 he joined the U. S. Geological Survey and headed the party that surveyed the boundary line between Alaska and Canada. He was appointed Governor of Alaska in 1918 and held that post for three years. He was appointed to the International Boundary Commission in 1933.

LOUIS E. MOYER, 58, for 25 years county assistant engineer in charge of maintenance and construction of highways in Seneca County, New

Twenty-two REASONS Why FLEX-PLANE Dummy Joints are Necessary in Modern Concrete Pavements

- Reduces the Number of Expansion Joints
- More Dummy Joints Divide Contraction Openings
- Prevents Cracking
- Retards Creeping
- Controls Warping
- Reduces Curling
- Relieves Stress
- Lessens Bumps
- Minimizes Pumping
- Minimizes Panning
- Lessens Deterioration
- Lowest Cost
- Limits Maintenance Cost
- Anchored in Place — Is Permanent
- No Extrusion
- Localizes Expansion and Contraction
- Assists in Normalizing the Slabs
- Ribbon Joint is Continuous in Length
- Prevents Infiltration of Water
- Increases Strength of Slabs
- Produces Homogenous Structure
- Provides Expansion Relief for the Hot Upper Part of the Slab



FLEX-PLANE joint installing machines eliminate messy hand methods. Install all types of joints . . . ribbon, poured, pre-moulded, etc., with or without VIBRATION.

- Ask for Equipment Specifications •

FLEXIBLE ROAD JOINT MACHINE CO. WARREN, OHIO U. S. A.

Reliance

CRUSHING, SCREENING
and WASHING UNITS

- Up to 2000 Tons a Day •

Crushers	Bins	Drag-Lines
Elevators	Pulverizers	"GAYCO"
Sweepers	Feeders	Centrifugal
Screens	Spreaders	Air Separators
Wash Boxes	Kettles	
	Conveyors	

UNIVERSAL ROAD MACHINERY CO.
Kingston, N. Y.

Canadian Representatives: F. H. Hopkins & Co., Ltd.
340 Canada Cement Co., Montreal, Que., Can.

South Bend
GUTTER-SNIPE
PICK-UP STREET SWEEPERS

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Since 1908

MUNICIPAL SUPPLY COMPANY - SOUTH BEND 23, INDIANA

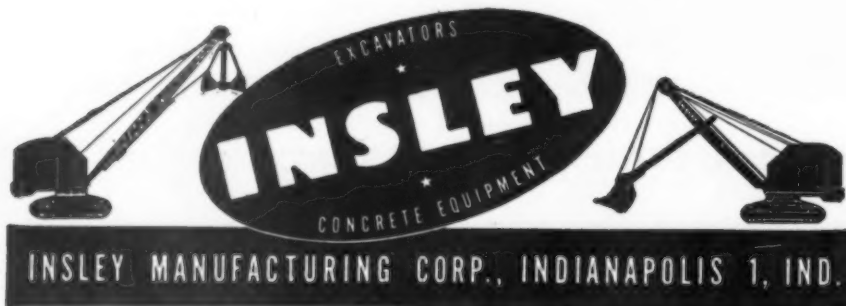


No Tipping

The Insley Excavator's unusual hook roller construction offers two outstanding advantages. Three hook rollers are provided to secure the revolving frame to the lower frame. Their location, one in front and two in the rear, prevents the revolving frame from tipping . . . assures proper balance on rough ground and under heavy load. This hook roller construction also extends the life of equipment because it relieves the cen-

ter pin of all vertical stress . . . requires it to take *only* the horizontal shear load.

As in this one particular instance, you'll find that every detail of Insley's design and construction makes an important contribution to dependable, low-cost performance on the toughest jobs—dirt, rock or what have you! That's why it will pay you to get all the facts on $\frac{3}{8}$ and $\frac{1}{2}$ -yd. Insley Type K Excavators.



York, died Jan. 25, in Seneca Falls, N. Y.

BENJAMIN P. CAPE, 67, owner of James Cape & Sons, road and bridge contractors, Racine, Wis., died Jan. 12. He had been associated with the company since 1899.

MIKE HAASE, 64, for over 40 years engaged in highway and railroad construction in Missouri and Kansas, died recently at his home in Kansas City, Mo.

CHARLES R. WARD, 69, Commissioner of Public Works for the Borough of Brooklyn, N. Y., from 1933 to 1937, died last month in Brooklyn, N. Y.

COL. SOLOMON W. ROESSLER, 91, Corps of Engineers, U. S. Army, retired, died Jan. 17, in Bridgeport, Conn.

JOSEPH G. BRAMER, 65, of Chapman & Bramer Co., Springfield, Ill., died recently. He had been a contractor for the past 40 years.

STEPHEN E. BURKE, 60, assistant superintendent of streets of Brookline, Mass., and secretary of the Massachusetts Highway Association, died Tuesday noon, January 23, from a heart attack while driving his car into the town yards.

With the Manufacturers and Distributors

Wm. Krauser Promoted by LeTourneau

Promotion of William Krauser as special representative of its Export Division has been announced by R. G. LeTourneau, Inc., Peoria, Ill. For the duration Mr. Krauser will take up his duties at 1026 17th Street, N. W., Washington, D. C., after which he will establish a permanent LeTourneau office in New York City. Mr. Krauser, with LeTourneau since April of 1942, and recently Manager of Sales Training Department, has previously been associated with Schramm, Inc., as its St. Louis district manager.



Wm. Krauser

C. E. Searle Elected President of Worthington

The Board of Directors of Worthington Pump and Machinery Corporation have elected Clarence E. Searle president of the corporation, to succeed Harry C. Beaver, who was elected vice chairman of the board of directors, and chairman of management committee. Mr. Beaver has been president of the corporation since 1931, and Mr. Searle has been vice president in charge of sales since joining the Worthington organization in 1932, following a long period of



C. E. Searle



H. C. Ramsey

service in various executive capacities with the Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Hobart C. Ramsey, vice president in charge of operations, was elected executive vice president. Edwin J. Schwanhausser, vice president in charge of the corporation's manufacturing and sales operations in Buffalo,

was elected vice president in charge of sales. Leslie C. Ricketts, manager of the corporation's Harrison Works, was elected a vice president. These elections became effective Jan. 1, 1945.

Union Metal Enters Parking Meter Field

The Union Metal Manufacturing Co., Canton, O., has purchased certain assets of The Dual Parking Meter Co., whose principal office has been located in Oklahoma City, Okla. The manufacture and repair of Dual meters will be done at Union Metal's main plant in Canton and at The Superior Switchboard & Devices Co., a local subsidiary of Union Metal in Canton. Sales and servicing will be handled by The Dual Parking Meter Co. with offices in the Harter Bank Building, Canton. Officers of The Dual Parking Meter Co. operating out of Canton are as follows: C. A. Orr, president; W. R. Crusoe, vice president; and C. A. Streb, secretary and treasurer. Messrs. Orr and Streb are respectively president and secretary of Union Metal. Mr. Crusoe, who has been associated with The Dual Parking Meter business since 1938, will be in charge of the active management of the Dual Company located at Canton. Union Metal's entrance into the parking meter field is another step in a planned program of product diversification and full utilization of plant facilities after the war.

New Appointments by Jaeger

As part of the expansion of its sales and service organization needed to coordinate with enlargements of plant and equipment lines during the war, The Jaeger Machine Co., Columbus, O., is establishing completely staffed regional headquarters in New York City, Chicago and Birmingham, Ala., to serve directly the Eastern, Midwest and Southern territories. As Eastern Regional Manager L. T. Phillips will direct sales and service for Jaeger construction, paving and industrial equipment in New England and Atlantic coast states as far south as North Carolina. Branch offices for this region are being established at Baltimore, Philadelphia and Richmond. The Chicago area, in charge of V. G. Mandt, will serve the area from Illinois and Western Michigan to Kansas, Nebraska and the Dakotas with branches at St. Louis and Minneapolis. The area from Tennessee south to the Gulf and west to Arkansas will be served from Birmingham headquarters where E. G. Mandt has been appointed regional manager.

Shunk

GRADER AND SCARIFIER BLADES

For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—

**CUTTING EDGES,
WEARING BOOTS,
BACK SLOPERS,
EXTENSION BLADES,
MOLDBOARDS
and
SCARIFIER TEETH**

Fifty years of specializing in the manufacture of Construction Equipment Blades has developed for your benefit a quality of special steel, milled through our own rolls and forged at the edges to give that extra cutting and wearing quality you need.

Furnished in various widths, lengths, and thicknesses, punched ready to fit your machine.

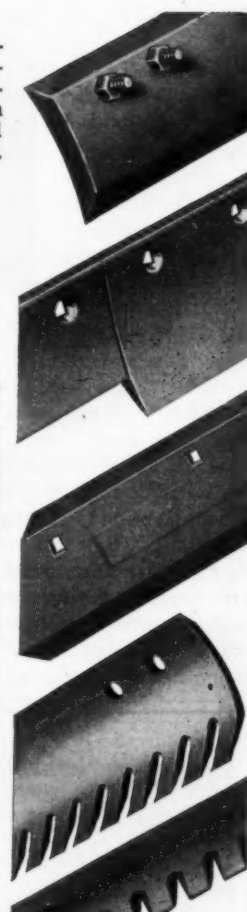
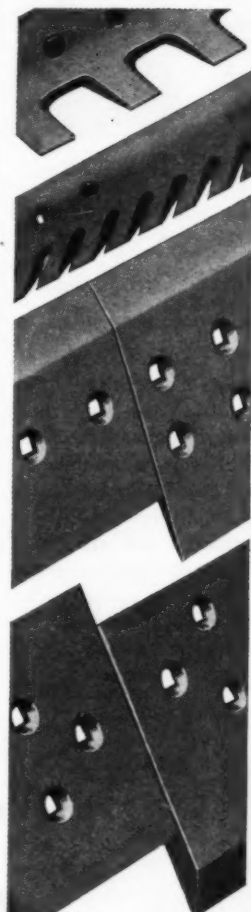
Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.



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MANUFACTURING COMPANY

Established 1854
BUCYRUS, OHIO,



Aeroil
TRADE MARK REG.

employees and management are honored to announce that the Army-Navy "E" Award for excellence in war production was made on Thursday, December twenty-eighth, nineteen hundred and forty-four.

AEROIL BURNER COMPANY, INC.

West New York, N. J.
CHICAGO SAN FRANCISCO DALLAS

**PORTABLE
ASPHALT PLANTS**
High Production—Low Cost



THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

Service facilities in each of the above areas will include construction and paving engineers and specialists in the air compressor field in which Jaeger will continue to manufacture a complete line of portable and industrial units of the type it has been producing for war needs.

New Heil N. W. District Offices

The Heil Co., Milwaukee, Wis., has announced the opening of Northwest District Sales Offices in the White-Henry-Stuart Bldg., 1338 Fourth Ave., Seattle 1, Wash.

The new offices will be under the direction of John Barclay, who has been with the company for many years, and will provide on the spot sales assistance for Heil dealers and distributors in Washington, Oregon, Montana, Idaho and Wyoming. Heil products distributed in this territory include truck bodies and hoists, road machinery, transportation tanks, storage tanks, bottle washers, forage crop dehydrators and home heating systems.



John Barclay

O. J. Ellertson Now in South America

O. J. Ellertson, Export Manager of the Pioneer Engineering Works, Inc., of Minneapolis, Minn., left the latter part of January for a trip to South America. He will go down the west coast to Santiago, Chile, and return along the east coast via Buenos Aires and Rio de Janeiro.



O. J. Ellertson

3-M Promotes Trio to Sales Managers

Three promotions in the tape division of Minnesota Mining and Manufacturing Co., St. Paul, Minn., have been announced by G. H. Halpin, vice-president and general sales manager. Bernard W. Lueck, a sales engineer for the last several years, becomes products sales manager of industrial "Scotch" masking tape, sandblast stencil and "Scotch-Rap," with headquarters in St. Paul. He joined 3-M in 1935. Robert L. Westbee, who became a member of the organization in 1933, has been named sales manager of electrical tape and electrical insulation products. C. N. Del Porte, who has been working out of the St.



B. W. Lueck



R. L. Westbee

Louis, Cincinnati and Chicago offices in the shoe tape line, is the new sales manager for that product.

Promotions by Caterpillar

C. A. Woodley, until Jan. 1, 1945, factory manager of Caterpillar Tractor Co., Peoria, Ill., has been promoted to assistant general factory manager and William Naumann, his former assistant has been promoted to factory manager. Both Mr. Woodley and Mr. Naumann are graduates of the company's four-year apprentice machinists training course. Mr. Woodley began his career with the company in 1926 and Mr. Naumann in 1929.



LOOKING
AHEAD?

Include

TUTHILL GUARD RAILS

in Your Plans

IN facing the future and planning your Postwar Highway Safety Program, be sure to face the facts about why it will pay you to specify TUTHILL—the GUARD RAIL that stands straight as a sentry wherever installed.

TUTHILL stands up, and keeps standing for two valid reasons: First, it is struck less. Its convex surface is seen quicker, more clearly, at longer distances and under all weather conditions. Secondly, it is damaged less when struck. Its deflective action prevents serious damage. It saves more lives, permits less damage.

TUTHILL GUARD RAILS are now available for complete installations, maintenance and repairs. Write for details.

Pacific Coast Manufacturers and Distributors
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COMPANY
761 POLK ST... CHICAGO 7, ILL.



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IT'S THE



HOME OF THE FAMOUS

VOGUE ROOM

1000 ROOMS WITH BATH
RADIO IN EVERY ROOM
FIVE FINE RESTAURANTS
CENTRAL DOWNTOWN LOCATION

Wickwire Spencer Elects R. T. Dunlap Director

The Wickwire Spencer Steel Co., New York, N. Y., has announced the election of Robert T. Dunlap as a member of the Board of Directors. Mr. Dunlap has been associated with Wickwire Spencer since 1943. He is also vice president in charge of production of Wickwire Spencer. Well known in the steel industry, under Mr. Dunlap's direction the operating efficiency of the various Wickwire Spencer plants and steel mills has been greatly increased through improvement and rehabilitation of facilities and the installation of production economy. Mr. Dunlap will continue to make his headquarters in Buffalo at the company's plant at River Road.

Gardner-Denver Reorganizes Export Division

In order to facilitate handling of its extensive export activities, Gardner - Denver Co., Quincy, Ill., has established the main office of its export department in New York City. This arrangement has



G. V. Leece

been made in contemplation of a material expansion in export sales activities. Located in the Woolworth Building, New York City, the new Gardner-Denver export office will be headed by G. V. Leece, vice-president of the company, who will now have charge of the entire Export Division. Associated with Mr. Leece in the New York export office are S. T. Brown, assistant manager, and Harold Weber, assistant sales manager. Edward Church will now be associated with the Denver office in the Export Division. C. E. Kaiser, who was assistant export manager under Mr. Church, will be in charge of the export division in Quincy.

New Distributors for Davey

Davey Compressor Co., Kent, O., has announced the appointment of Hoye and Williams, 1417 Dalzell St., Shreveport, La., as agents for the Davey line in the northern Louisiana territory, and the addition of General Machinery and Equipment Co., Inc., 801-15 Woodland Ave., Kansas City 6, Mo., as a new franchise dealer for Davey products which include portable and stationary compressors, heavy-duty truck power take-offs and pneumatic saws.

J. J. Yezbak Now Timken Public Relations Manager

John J. Yezbak has been appointed manager of public relations as well as the news bureau of The Timken Roller Bearing Co., Canton, O. Mr.

Yezbak, who has been head of the firm's news bureau since joining the company in June, 1943, is a graduate of New York University. The newly-created public relations department was organized to co-ordinate all public relations activities of the company.

ORIGINAL SCHINCK

Automatic

With
PATENTED "PERFECTION" DUMP CONTROL

Tackles the work of ten men!—Does the job faster, cheaper! Saves dollars and precious man hours!

Loads sand, gravel or dirt at rate of 40 to 60 yards an hour! Used also for scraping, leveling, grading! No idle time with this ever-useful, much-needed equipment. Its ease and speed of operation, even in close quarters, make it a real time and money saver in every type of road or construction work.

THE LOW COST LOADER THAT HANDLES BIG JOBS!

Big ½ yard scoop handles 1500 to 2000 pounds of gravel, sand or dirt per scoop . . . does it easily, smoothly. Lifts load 8 feet. Dumps load at any height. Positive action from power take-off! Operator has perfect control. Unit built to give a lifetime of service-free operation. Dependability, economy and satisfaction proved on hundreds of big construction and maintenance jobs.

NOW AVAILABLE . . . A limited number of these famous loaders available for the first time in two years. Write for illustrated literature and prices.

Automatic EQUIPMENT MFG. CO.
504 MAIN ST. Pender, Nebr.

TRACTOR LOADER

Attaches TO ANY TRICYCLE TRACTOR



Now STANDARD EQUIPMENT for ROAD BUILDERS and CONTRACTORS

HERE ARE JUST A FEW BIG USERS:

HARGROVE CONST. CO.
Grand Island, Nebr.

PETER KIEWITT & SONS
Omaha, Nebr.

JOHN KELLY CONST. CO.
Fairbanks, Ind.

STATE OF NEBRASKA, DEPT. OF ROADS AND IRRIGATION

SAND ORE CONST. CO.
McPherson, Kans.

You Too Should Have an Automatic on the Job on EVERY LOCATION!

Round and Round They Go

All Over the World!

EWC WHEELS

We've been making good wheels for more than half a century—and had begun to get a little complacent about it—until people began telling us what a job EWC Wheels were doing all over the world. Our accumulated experience, and modern engineering combine to produce outstandingly fine wheels to meet every need. Now, with the most modern equipment to produce disc wheels, we are in a doubly fine position to work with you.

Write for special information about EWC Wheels.

EWC WHEELS

Electric Wheel Co., Dept. RS Quincy, Ill.



H. G. Sours and E. E. Baldwin Form Distributor Firm

Hal G. Sours, former state highway director, and Eugene E. Baldwin, of Taylor & Baldwin, Columbus, Ohio, announced today that they have formed a partnership to handle highway materials and equipment. The firm will be known as "Baldwin & Sours," with offices at 83 South High Street, Columbus, Ohio.

The principal products which they have to distribute are asphalt, road oil, chemicals for ice control, bituminous distributors and accessories, street sweepers, salt and stone spreaders and truck scrapers. Several additional products will be added during the next few months.

Sours has been in State and County highway work for the past twenty-four years. He served three terms as county engineer of Summit county and was with the state highway department in northern Ohio for several years. The past six years, he has been in the Columbus office, first as the Chief Engineer and then Director of the State Highway Department. For many years active in highway asso-

ciation activities, he was President of the American Road Builders' Association two years and more recently Vice President of the American Association of State Highway Officials.

Baldwin has been a member of the firm of Taylor & Baldwin the past twenty years. Mr. Taylor, who died four years ago, was a former state highway director.

A. D. Stivers Manager Texaco Asphalt Sales

The Texas Company has appointed A. D. Stivers Manager of its Asphalt Sales Department, effective February 1st, to succeed Frank V. Widger, who has retired. Mr. Stivers has been associated with the marketing of Texaco Asphalt products in the road building and other fields for the past twenty-six years. From 1919 to 1939, he operated in the southwest, first as Representative and later as District Manager. Transferred to New York in 1939, as Assistant Manager of the Asphalt Sales Department, he held that post until recently appointed Manager. Sales of Texaco Asphalt throughout the United States now come under his supervision.

G. R. Morgan New Representative for Walter Motor Truck Co.

Walter Motor Truck Co., Ridge-wood, Queens, L. I., N. Y., has announced the appointment of George R. Morgan as factory representative for Walter snow fighters and Walter tractor trucks in Minnesota, Iowa, Illinois, North Dakota, South Dakota, Michigan and Ohio. Mr. Morgan has established headquarters at 2647 Queen Ave., No., Minneapolis, Minn. Mr. Morgan is well known in the truck and equipment field, having formerly been connected with the Iowa Highway Commission as assistant resident engineer, with the National Park Service and U. S. Army at Omaha, Neb., as equipment engineer, and with the W. P. B. regional office in Minneapolis, as construction machinery specialist.

E. C. Hite Promoted by Timken

Everett C. Hite, has been appointed combustion and refractories engineer in the Steel Mill Metallurgical Department of The Timken Roller Bearing Co., Canton, O. He has been an assistant engineer in the same department.

Clearing House

TIRE REPAIRS

In all sizes of tractor, truck, wheelbarrow, passenger or 1800x24 tires. An Equi-Flex "Sectional" repair constructed in your tire is guaranteed. Best results and prompt service!

It is a fact that we do repair run flat tires, passenger and truck, without a retinner!

WALLACE TIRE SERVICE, Inc.
2320 S. Michigan Ave. Chicago, Ill.

Modern Asphalt Plant

1 Ton Cummer Complete with Vibrating Screen, Electrical Timer and Feeder Bin.
IMMEDIATE DELIVERY

L. M. STANHOPE

304 Conestoga Road Wayne, Penna.

Tanks In Stock

18 Heavy Rail Car Tanks
6000, 8000, 10,000 with and without coils

L. M. STANHOPE

WAYNE PENNA.

WANTED: Experienced Contractor on stabilized base construction and asphalt surface treatments. Must own complete equipment. For work in Colombia, South America. Guaranteed a minimum contract of 500,000 square yards. First class references required. Apartado 415, Cali, Colombia. Box 790, Roads & Streets 330 South Wells Street, Chicago 6, Ill.

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"Cliff" Gould Returns to Barber-Greene Company

Lt. Col. C. B. (Cliff) Gould, for many years manager of the Detroit office of Barber-Greene Company, Aurora, Ill., manufacturer of asphalt paving machines and material handling equipment, has recently been released from the Army Air Corps, and has again assumed duties with Barber-Greene in his previous capacity, with headquarters at 25 E. Seven Mile Road, Detroit, Michigan.

Lt. Col. Gould returns to Barber-Greene after several busy and very interesting years with the Army Air Corps. His first assignment was at Morrison Field, West Palm Beach, where he was Engineer Officer of the 15th Group. Since fall, 1943, he has been with the Army Air Transport Command, Homestead, Florida, which Command has the responsibility of getting our combat and cargo planes to the theaters of operation. While there, he was Commanding Officer of the 54th Squadron.

Booklets and Pamphlets Received

Revised Recommendations for Tar Surface Dressings. Wartime Road Note No. 8 (superseding Note No. 1 on same subject), 12 pages; issued by the Department of Scientific and Industrial Research, Road Research Laboratory, in cooperation with the Ministry of War Transport, Harmondsworth, West Drayton, Middlesex, England.

Summary of Public Roads Administration's Activities, reprinted from the Annual Report of the Federal Works Agency, 1944; 28 pages. Received from PRA headquarters, Washington, D. C.

The following reports, Purdue University Engineering Experiment Station, LaFayette, Indiana, all dated Dec. 12, 1944:

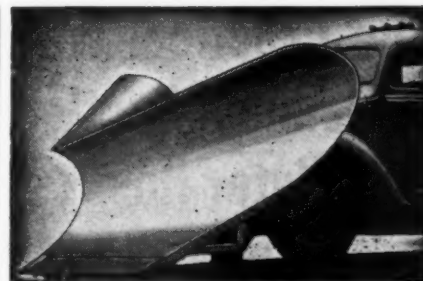
Large-Scale Model Studies of Highway Subdrainage, by Bram McCeland, Reprint No. 12.

Movement of Calcium Chloride and Sodium Chloride in Soil, by Charles Slessor, Reprint No. 11.

Indiana War Time Traffic Speeds, by Robert E. Frost, Reprint No. 10.

Pumping of Rigid Pavements in Indiana, by K. B. Woods and T. E. Shelburne, Reprint No. 14.

The Engineering Significance of Soil Patterns, by Donald J. Belcher, Reprint No. 13.



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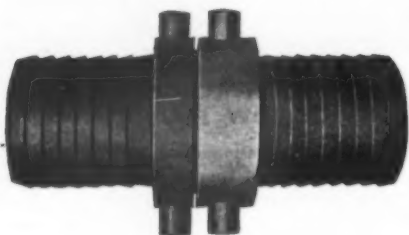
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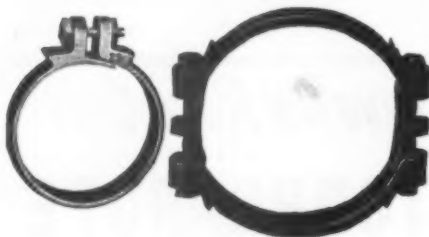
TBI

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A black and white photograph showing a large lattice boom crane lifting a heavy, dark object, possibly a piece of machinery or a large container, from a flatbed trailer. The crane is positioned on the left, with its boom extending diagonally across the frame towards the top right. The object being lifted is suspended by cables and is positioned above the trailer on the right. The background features a cloudy sky and a construction site with gravel and tracks in the foreground. The image has a vintage, slightly grainy quality.**AMERICAN CHAIN & CABLE • BRIDGEPORT**



Construction BACKLOG

HALTED by the war, construction on the 11,000-ft. Brooklyn-Battery Tunnel in New York City will be resumed when 790 tons of giant nuts and bolts—such as shown in inset—become available. The tunnel, still three years from completion, is only one project of a post-war construction backlog already estimated at over 15 billion dollars.

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